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No. 2311

United States

Circuit Court of Appeals

For the Ninth Circuit.

Transcript of Record.

(IN THREE VOLUMES)

ALASKA TREADWELL GOLD MINING COMPANY, a Corporation, ALASKA UNITED GOLD MINING COMPANY, a Corporation, ALASKA MEXICAN GOLD MINING COMPANY, a Corporation, and ROBERT A. KINZIE,

Appellants,

vs.

ALASKA GASTINEAU MINING COMPANY, a Corporation,

Appellee.

VOLUME I.

(Pages 1 to 352, Inclusive.)

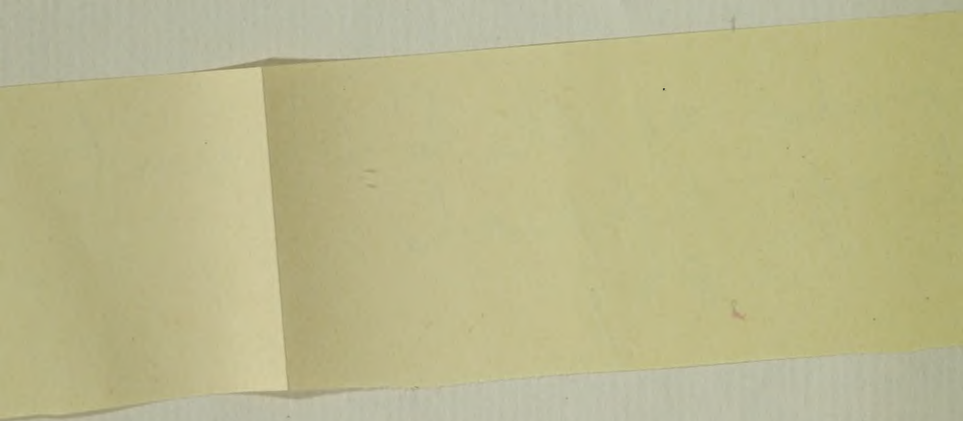
Upon Appeal from the United States District Court for the District of Alaska, Division No. 1.

FILED

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Records of the S. Circuit
Court of appeals

837



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[Names and Addresses of Attorneys.]

*In the District Court for the District of Alaska, No.
One, at Juneau.*

ALASKA GASTINEAU MINING COMPANY, a
Corporation,

Plaintiff and Appellee,

vs.

ALASKA TREADWELL GOLD MINING COM-
PANY, a Corporation, ALASKA UNITED
GOLD MINING COMPANY, a Corporation,
ALASKA MEXICAN GOLD MINING
COMPANY, a Corporation, and ROBERT
A. KINZIE,

Defendants and Appellants.

Messrs. SHACKLEFORD & BAYLESS and Z. R.
CHENEY, of Juneau, Alaska,

Attorneys for the Plaintiff and Appellee.

Messrs. HELLENTHAL and HELLENTHAL, of
Juneau, Alaska,

Attorneys for the Defendants and Appel-
lants. [1*]

*In the District Court for the District of Alaska, Di-
vision No. One, at Juneau.*

No. 968-A.

ALASKA GASTINEAU MINING COMPANY, a
Corporation,

Plaintiff,

vs.

*Page-number appearing at foot of page of original certified Record.

ALASKA TREADWELL GOLD MINING COMPANY, a Corporation, ALASKA UNITED GOLD MINING COMPANY, a Corporation, ALASKA MEXICAN GOLD MINING COMPANY, a Corporation, and ROBERT A. KINZIE,

Defendants.

Complaint.

Comes now the plaintiff above named and complaining of defendants alleges:

I.

That the plaintiff above named is a corporation duly organized and existing.

II.

That the defendants above named, as corporations, are corporations duly organized and existing, and that the defendant Robert A. Kinzie is the Superintendent of each of the said defendant corporations above named.

III.

That on and prior to the month of August, 1909, the International Trust Company was a corporation and in possession and control for the benefit of certain bondholders of that certain power plant at the mouth of Sheep Creek, near Juneau, in the District of Alaska, and hereinafter called the Sheep Creek Power Plant, and hereinafter more fully described.

IV.

That the said International Trust Company was at said time about to organize a corporation known as the Oxford Mining Company for the purpose of taking over the said Sheep Creek Power plant and

other property for the benefit of the bondholders for whom the International Trust Company held the said property in trust.

V.

That prior to August, 1909, the said power plant and property above described had been used by the said International Trust Company and its predecessors in interest for the purpose of and in connection with the generation of power for the operation of what is known as the [2] Sheep Creek Mines, which said mines were provided with a railway, trams, compressor plant, lighting plant, rock-crushers and a thirty-stamp mill, and with a number of other mechanical appliances theretofore used in mining ore from what is known as the Sheep Creek Group of Mines.

VI.

That the International Trust Company was not only in the possession and control of the said Sheep Creek Power plant, but was also in the possession and control of the mines near Juneau, Alaska, known as the Silver Bow Basin mines, including the Ground Hog Group of mines, and also claimed full equitable title to the Sheep Creek Group of mines which the said power plant had theretofore been used to operate.

VII.

That in the month of August, 1909, F. W. Bradley approached the attorney for the International Trust Company and stated that it was the desire of the defendant corporations, above named, to secure possession and control of the said Sheep Creek Power

plant, and that it was the desire of the defendant corporations to construct upon certain millsites hereinafter specifically described a water-power plant of substantial size and efficiency for the generation of electric power of a producing capacity of about 3,000 horse-power, and that he was desirous of leasing the property from the parties interested therein during the period of the construction of said power plant; and upon the construction of the said power plant, to provide to the said International Trust Company, or its successors, sufficient power to operate the mines owned, claimed and controlled by the said International Trust Company in the vicinity of Sheep Creek and Silver Bow Basin, and accept in exchange therefor a deed for the Sheep Creek Power plant.

VIII.

That at said time the said F. W. Bradley was the General Consulting Engineer of the said defendant companies and had full charge and control of their operations, constructions and developments in South-eastern Alaska, and full authority to represent the said defendant companies; and that with him at said time was H. H. Taylor, the president [3] of said defendant companies which concurred in the said representations that said F. W. Bradley represented at said time that a current of two hundred electric horse-power would be an ample current to continuously mine and operate the said mines and mining plants. That the representative of the International Trust Company then and there represented to the said F. W. Bradley that a contract of that character would meet with his recommendation, pro-

vided the Oxford Mining Company and the International Trust Company were not restricted to the use of the power at the mines then owned and claimed by them; and further stated that the question of the amount of power which it would be necessary to use continuously in the operation of the International Trust Company's property must be reserved for submission to the said International Trust Company and the parties interested with the International Trust Company in the said properties; and that thereupon, at the request of the said F. W. Bradley, a representative of the International Trust Company departed for Boston and presented a form of contract which had been drawn up under said representations by the said F. W. Bradley to the said International Trust Company and the parties interested with the International Trust Company in the above-described property.

IX.

That after taking advice upon the subject, the parties above named decided that they would be in need of the continuous and uninterrupted use of three hundred horse-power which would be fully consumed when their operations upon the said properties were resumed; and the said International Trust Company and the parties interested with the International Trust Company notified the said F. W. Bradley that they would be willing to enter into such agreement, provided they were given a continuous and uninterrupted use of three hundred horse-power. The said F. W. Bradley, acting for the defendant companies, replied that he would agree to give a continuous cur-

rent of three hundred horse-power in exchange for the property above specifically described, and that thereupon the International Trust Company caused the Oxford Mining Company, a corporation, to be incorporated, and deeded the said property to the Oxford Mining [4] Company for the benefit of the parties interested through the said International Trust Company in the said property; and thereafter the Oxford Mining Company duly executed a lease in the form drawn up and submitted by the said F. W. Bradley at the time the aforesaid representations were so made, with the exception that the words "two hundred horse-power" as originally given in said lease were changed, in all instances, to the words "three hundred horse-power."

X.

That the said memorandum of agreement was entered into between said Oxford Mining Company and the defendant corporations in which the parties thereto respectively undertook and agreed as set forth in the said contract that the Oxford Mining Company and the other parties interested with the Oxford Mining Company were induced to sign the said agreement by the representations of the said F. W. Bradley to the effect that the contract he was offering was a flood-water contract, and would provide to the mines of the Oxford Mining Company a sufficient power to start and operate its machinery and carry on its operations, and to continuously use in such operations an uninterrupted current of three hundred horse-power. That the said contract so signed, sealed and delivered between the parties is

in the following words and figures, to wit: [5]

THIS INDENTURE AND AGREEMENT made and entered into this 14th day of October, 1909, by and between Oxford Mining Company hereinafter called the lessor and The Alaska Treadwell Gold Mining Company, the Alaska Mexican Gold Mining Company and the Alaska United Gold Mining Company hereinafter called the lessees.

WITNESSETH, First, the lessor has P. J. K. this date and does by these presents lease N. P. unto the lessees all of the following described real property situated on and near Sheep Creek in the Harris Mining District, District of Alaska, to-wit:

The Mexico Mill-site U. S. Mineral Entry No. 25, lot 71B. The Belvedere Mill-site U. S. Mineral Entry No. 25, lot 72B. The Jumbo Mill-site U. S. Mineral Entry No. 60, lot No. 260. Also that certain piece or parcel of land beginning at a stake identical with post No. 2 Jumbo Mill-site U. S. Survey No. 260 on the meander line of Gastineau Channel; thence first course along the meander line of Gastineau Channel at ordinary high water mark N. P. J. K. $52^{\circ} 00'$ W. 54 feet to stake No. 2; thence N. P. second course N. $48 15'$ E. 200 feet to stake No. 3; then S. $52.00'$ E. 54 feet to the N. W. side line of Jumbo Mill-site U. S. Survey No. 260, 200 feet to stake No. 1, the place of beginning containing an area of one quarter of an acre more or less, courses expressed from the true meridian, Mag. Var. $29.30'$; and also that certain water right known as the Sheep Creek Water Right and located on Sheep

Creek about three quarters of a mile from its mouth, together with the flume and pipe-line connecting the same with the beach near the mill at the mouth of the said Sheep Creek, also the saw-mill, boarding house, lumber sheds, wharf landing, mill dam, flumes, penstocks, water-wheels, and all other machinery and appliances used in connection with said saw mill, situated near the mouth of said Sheep Creek, together with all machinery, tools, equipment, plants of every kind and description now upon said property for a term of ten (10) years from the date hereof at a monthly rental of One Hundred and Twenty-Five (\$125.00) Dollars per month; payable in gold coin of the United States on the first day of each month during the term of said lease at P. J. K. the office of the lessees at Treadwell, N. P. Alaska; and it is hereby agreed, that if any rent shall be due and unpaid, or if default shall be made in any of the covenants herein contained, that it shall be lawful for the lessor to re-enter said premises and remove all persons P. J. K. therefrom, and the lessees do hereby N. P. covenant, promise and agree to pay the lessor the said rent in the manner hereinbefore specified, and not to let or underlet the whole or any part of said premises without a written consent of the lessor, nor to assign this lease or any part thereof without said written consent, and at the expiration of said term the party of the second part will quit and surrender said premises in as good state and condition as the same now are.

It is the intention of the lessees to erect, equip and

maintain upon said premises a water power plant of substantial size and efficiency for the generation of electric power, and if at any times after Two (2) years from the date hereof the lessor or its assigns shall elect to take a current of not to exceed three hundred (300) electric horse-power which shall be taken from and at the generating plant to be installed upon the leased premises hereinbefore described, the lessees undertake, covenant and agree to deliver said current to the lessor or its assigns upon the execution and delivery by the lessor or its assigns

to the lessee of a deed or deeds conveying
P. J. K. said leased property herein described to

N. P. the parties of the second part. If prior to the expiration of nine years from the date hereof the lessor does not elect to convey to lessees or their assigns the property herein [6] leased and accept in full consideration therefor

P. J. K. the right to the use the three-hundred

N. P. (300) electric horse-power hereinbefore mentioned, the lessee may at their option

prior to the expiration of the ten (10) years provided in this lease purchase the property herein leased absolutely from the lessor by paying to the lessor the sum of Twenty-Five Thousand Dollars (\$25,000.) in gold coin of the United States; and the lessor covenants and agrees upon tender of said sum of Twenty-five Thousand Dollars (\$25,000.) to execute and deliver such deeds of conveyance to the property herein leased as hereinbefore specified, excepting only as to the title to (1) the one quarter acre tract hereinbefore described and (2) the premises occupied and used by

the existing wharf of the lessor to both of which the lessor now asserts only possessory titles.

P. J. K. The lessees may at their own cost and

N. P. expense undertake to perfect the said titles and should lessee wish so to do the lessor shall lend all proper assistance in its power including the using of its name, and should the said titles be so perfected to the said premises or either of them, they shall become the property of the lessor and remain covered by this lease and subject to all the terms and conditions thereof.

The covenants herein contained shall be construed as running with the land and as a charge thereon, so that any successor or successors in interest

P. J. K. to the lessor or lessees who may acquire

N. P. any interest in and to the titles to the said land shall be bound by this conveyance in the same manner as if they had executed this agreement; and the lessees hereof may require at their option that the property herein described by conveyed by the lessor to a responsible Trustee for the purpose of carrying out the terms of this agreement, or that deeds and conveyances covering the property herein leased be placed in escrow so as to insure delivery of the same if required under the provisions of any of the covenants of this lease.

If neither of the options herein provided for are accepted by either the lessor or the

N. P. lessees then the property and rights herein described with all the improvements that are or that may be hereafter placed on the said premises shall be and become the property of the lessor.

The provisions herein as to the delivery of three

hundred (300) horse-power at the generating plant to be installed on the premises herein described contemplates the delivery of an uninterrupted current, but the lessees shall not be liable for damages that may arise from operating and physical causes beyond its control.

IN WITNESS WHEREOF, the parties hereto have hereunto set their hands and seals the day and year first above written.

Executed in triplicate.

Witness:

HAROLD LAWRENCE.

WALTER W. BLACK.

OXFORD MINING COMPANY,

WALLACE HACKETT,

President,

And HENRY ENDICOTT,

Treasurer.

ALASKA TREADWELL GOLD MINING
COMPANY,

By H. H. TAYLOR,

President,

F. A. HAMMERSMITH,

Secretary.

ALASKA MEXICAN GOLD MINING CO.

By H. H. TAYLOR,

President,

F. A. HAMMERSMITH,

Secretary.

ALASKA UNITED GOLD MINING CO.

By H. H. TAYLOR,

President,

F. A. HAMMERSMITH,

Secretary. [7]

State of California,

City and County of San Francisco,—ss.

On this 12th day of November, in the year One Thousand Nine Hundred and Nine, before me, P. J. Kennedy, a Notary Public, in and for said City and County, residing therein, duly commissioned and sworn, personally appeared H. H. Taylor, and F. A. Hammersmith known to me to be the President and Secretary respectively of Alaska Mexican Gold Mining Company and Alaska United Gold Mining Co., the Corporations that executed the within and foregoing instrument, and to be the officers who executed the said instrument on behalf of said Corporations therein named, and they acknowledged to me that such Corporations executed the same.

In Witness Whereof, I have hereunto set my hand and affixed my official seal, at my office, in the said City and County of San Francisco, the day and year last above written.

[Seal]

P. J. KENNEDY,

Notary Public in and for the City and County of
San Francisco, State of California.

State of California,

City and County of San Francisco,—ss.

On this 12th day of November, in the year One Thousand Nine Hundred and Nine, before me, P. J. Kennedy, a Notary Public, in and for said City and County, residing therein, duly commissioned and sworn, personally appeared H. H. Taylor and F. A. Hammersmith known to me to be the President and Secretary respectively of Alaska Treadwell Gold

Mining Co., the corporation that executed the within and foregoing instrument, and to be the officers who executed the said instrument on behalf of said Corporation therein named, and they acknowledged to me that such Corporation executed the same.

IN Witness Whereof, I have hereunto set my hand and affixed my official seal at my office, in the said City and County of San Francisco, the day and year last above written.

[Seal]

P. J. KENNEDY,

Notary Public in and for the City and County of
San Francisco, State of California.

Commonwealth of Massachusetts,

County of Suffolk,

City of Boston,—ss.

Be it remembered, that on this 14th day of October, 1909, before me, the undersigned, a Notary Public in and for said County and State, personally appeared Wallace Hackett, President, and Henry Endicott, Treasurer, of the Oxford Mining Company, a Corporation, organized under the laws of the State of Maine, to me known to be the individuals described in and who executed the foregoing instrument as such president and Treasurer; and said Henry Endicott having affixed the seal of said Corporation to said instrument, they severally acknowledged to me that he, Wallace Hackett, as President, and he, Henry Endicott, as Treasurer of said Corporation, executed the foregoing instrument for and on behalf of said Corporation as the free and voluntary act of said Corporation for the uses and purposes therein set forth. Then the said Henry Endicott, being by me first duly

sworn, on his oath states that he is the Treasurer of said Corporation, is acquainted and is the custodian, and has in his possession the corporate seal of said Corporation, and that the seal hereinbefore affixed is the corporate seal of said Corporation, and was affixed by him as such Treasurer by order of the Board of Directors of said Corporation. [8]

In Witness Whereof, I have hereunto set my hand and seal the day and year first above written.

[Seal]

LLOYD A. FROST,

Notary Public.

My commission expires Dec. 5th, 1913. [9]

That the defendant corporations, above named, completed the construction of a water-power plant upon the property described in the foregoing agreement prior to the 31st day of October, 1910, and the said Oxford Mining Company elected to take the uninterrupted current of three hundred horse-power provided for in said agreement for the full, beneficial and practical use of the said current, to the full extent of three hundred horse-power, and to convey the property above specifically described, to the said defendant corporations, which said conveyance was duly accepted, time for receiving the same waived, and the same was received by the defendant corporations on or about the 22d day of April, 1911. That from the 22d day of April, 1911, until the 8th day of November, 1912, no power whatever was delivered by the defendant corporations to the Oxford Mining Company, or any of its assigns, and that the said defendant companies have had the free and uninterrupted use of the entire output of the said electric

plant between said dates, and have not paid to the Oxford Mining Company or its assigns any sum whatever since the 22d day of April, 1911.

XI.

That about the 1st of June, 1912, the Oxford Mining Company sold all of its property and property rights in Southeastern Alaska to the Alaska Gastineau Mining Company, the plaintiff above named, and subsequently at the request of the defendant corporations above named, the plaintiff procured from the Oxford Mining Company a specific assignment of all of the rights of the Oxford Mining Company to this plaintiff under the contract for the said three hundred horse-power above described, which said assignment was duly recorded in Book 19 of Miscellaneous Records of the Juneau Recording Precinct, at page 139, on the 14th of October, 1912; and the defendant corporations above named were duly notified of the said assignment. That during the month of June, 1912, this plaintiff entered into the possession of all the mines, mining property and mining rights of the Oxford Mining Company, including the Sheep Creek Group of Mines and the Silver Bow Basin and Ground Hog Group of Mines.

XII.

That it is the purpose and intention of this plaintiff to mine [10] an ore deposit stretching from the Sheep Creek Group of Mines in Sheep Creek Basin across the divide and into the Ground Hog Group of Mines in Silver Bow Basin containing 50,000,000 tons of ore more or less; and that among the properties acquired by this plaintiff is the prop-

erty known as the Perseverance Mine lying between the Ground Hog Group of Mines in Silver Bow Basin and the Sheep Creek Group of Mines in Sheep Creek; and that arrangements have been made for the rapid development of the said mines and for the construction of a six thousand ton crushing plant near Sheep Creek, upon Gastineau Channel, and capital provided for the purpose of construction of such plant and for the development work which will become necessary to produce a daily tonnage of not less than six thousand tons upon the completion of the said milling plant, which is to be completed at the end of about two years. That among other things the plaintiff has started an adit tunnel from Sheep Creek Basin underneath and through the Sheep Creek mines to the Ground Hog Group of mines and the Perseverance mines, and has also started a system of stopes, upraises, shafts, levels and ore chutes at and near the Perseverance and Ground Hog Group of Mines which will be adequate for the development of the same if continuously prosecuted to produce the tonnage required by the said milling plant upon its completion, but which will be inadequate to produce the tonnage and will greatly impair the producing capacity and delay the period of production if interfered with or if any delay is suffered in the initiation of said work. That since the month of June, 1912, the plaintiff has been using every effort to open upon its mining property as many working faces as is possible so as to make room for more drills and other appliances in the rapid development of the said mining property.

XIII.

That the said arrangements for the development of the said mining property were made in reliance upon the undertaking of the defendant corporations herein and their promise and representation that they would furnish a full and uninterrupted current of three hundred electric horse-power of full and practical efficiency for use by the plaintiff corporation and upon the representations that they would be able to use [11] three hundred horse-power from the electric plant of the defendant corporations during said period of development. That relying upon said representations the plaintiff has engaged for work in Silver Bow Basin in connection with the underground development of the said mine a force of more than 175 men, and is at a daily expense in maintaining said working force in the said underground development in Silver Bow Basin of over \$750.00. That plaintiff has outstanding bonds in the principal sum of \$3,500,000, upon which interest is accumulating and upon which no interest can be paid until the development work above mentioned is completed as proposed simultaneously with the completion of the said milling plant; and that the character and nature of the ore is such as to produce a profit thereon as soon as the work hereinbefore described is completed, and to pay the interest upon such bonds and dividends upon the stock of the company; and that any delay in the underground workings above set forth will postpone the producing capacity of the said plant and will cause great and irreparable damage to the plaintiff company which

cannot be adequately compensated or estimated in money. That labor is in great demand in the mining district near the said mines and that it will be very difficult to hold labor unless the laborers above mentioned are kept continuously at work during the winter season of 1912-1913.

XIV.

That prior to the 8th day of November, 1912, the defendant companies were notified of the assignment of the rights of the Oxford Mining Company to this plaintiff and were requested to deliver the uninterrupted current of three hundred horse-power provided for in the said contract. That at said time there was installed upon the property of the company in Silver Bow Basin a 200 horse-power motor of the usual type used in mining operations of like character throughout the United States and in the Juneau Mining District, which said motor was connected with an Ingersoll-Rand compressor using 165 horse-power at 80 pounds pressure, at which pressure the said compressor has been operated. That at the Sheep Creek plant of the plaintiff company there was installed [12] a 150 horse-power motor and a 20 horse-power motor; and that in connection with the 150 horse-power motor there was used a compressor of 165 horse-power for the purpose of driving the adit tunnel above mentioned through the Sheep Creek mines and from thence underneath the Ground Hog and Perseverance Mines. That the defendant corporations at said time connected their power-plant with the power-line of the plaintiff herein and set in their power-house a so-called Auto-

matic Circuit-Breaker which said circuit-breaker was so set as to break the circuit when a maximum of 100 amperes was carried over said current. That from the 8th of November, 1912, to the 2d of December the machinery above described at Sheep Creek was operated without difficulty from said current so supplied by the defendant corporations, and the setting of the circuit-breaker at said point proved to be sufficient to produce a practical and working efficiency at the power-house of the defendant company to three hundred horse-power. That on the 2d day of December, the machinery in Silver Bow Basin at the Perseverance Mine was also placed upon the said line and successfully operated until the 4th of December when operations at the Perseverance mine were temporarily suspended by reason of a fire which destroyed a 100-stamp mill of the plaintiff company at that point. That on the 6th of December one Proebstel, one of the servants of the defendant corporations, under the supervision of the defendant Kinzie, visited the Sheep Creek Power-house and reduced the setting of the circuit-breaker to a point which would throw off the current at 56 amperes; that is to say, the said automatic circuit-breaker was set so as to sever all current connections with the plaintiff company as soon as 56 amperes passed over the circuit at the Sheep Creek power-house to the wires of the plaintiff company in total disregard of the actual horse-power delivered and in total disregard of the power factor actually existing from time to time in plaintiff's operations, and total disregard of the reduced voltage required by the

plaintiff company when the amperage increased in starting plaintiff's machinery. That the said circuit-breaker so installed is not of the usual or ordinary type used in electrical appliances for such purposes, but is so [13] constructed that it is instantaneous. That the ordinary and usual type of circuit-breaker used for such purpose is provided with what is known as a thirty second time relay, which guards against the circuit-breaker being thrown out by momentary and unavoidable surges of current.

XV.

That the starting of machinery which will consume less than a given amount of power often causes what is known as a starting surge which lasts for a few seconds, but from a practical standpoint is not accounted for in electrical connections, and is disregarded and provided against by the ordinary type of time relay circuit-breaker. That the time relay circuit-breaker is one in common use in this vicinity, being used by defendant corporations in their electrical connections—except in their connections with the plaintiff.

XVI.

That in their so-called delivery of the horse-power under the contract above described the defendant corporations have estimated the power to be delivered upon the basis of what is known as unity power factor, that is to say, defendants have taken the position that a certain number of amperes multiplied by a power factor of 100 per cent and multiplied by a voltage of 2300 volts, multiplied by a constant at-

tributed to the three-phase electric current, will theoretically produce 300 horse-power, whereas at those times when the amperage increases by reason of starting surge or otherwise the high voltage artificially maintained by the defendants is unnecessary to the use of the plaintiff, and whereas the power factor actually involved is in all instances under 85% per cent and at the times when the amperage is high by reason of starting surge or otherwise, a great deal less than 85%. That the only measure of horse-power in proper and common practice upon electric current is what is known as the wattmeter, and that the defendants herein have failed to provide themselves with a wattmeter in estimating the amount of power taken by the plaintiff from their power-house under said contract, although in their own operations they measure the power used [14] by themselves by a wattmeter. That the wattmeter is the common and ordinary meter used in measuring horse-power and that the plaintiff herein has requested the defendants to allow them to place a wattmeter at the power-house of the defendants upon the power line used by the plaintiff at said power-house, and the defendants have refused to permit a wattmeter to be placed upon said current.

XVII.

That it is the common practice where a certain amount of horse-power is contracted for to allow a starting surge to the consumer sufficient to start the machinery which will consume the current contracted for.

XVIII.

That on or about the 13th of December, 1912, the said current was again turned on to the operation of the machinery at the Perseverance mine alone and the machinery successfully started and the current continued to operate the machinery at the Perseverance mine up until the night of the 24th of December when the mine shut down for Christmas Day, and that since said time the plaintiff herein has been unable to start the machinery at the Perseverance mine with defendant's current although the said machinery has not in anywise been altered or changed, nor the loads thereon been increased; and upon each attempt to start the said machinery the said circuit-breaker has been thrown out and the Perseverance mine has been without power since the night of the 24th of December, 1912, except a small amount of power derived from a water-wheel in Silver Bow Basin which has been able to furnish about half of the lights required at the mine. By way of experimentation, however, plaintiff company has been able to start and turn over its motors at the Perseverance mine and run them for considerable periods of time upon electric currents of less than 300 horse-power; in fact of less than 230 horse-power, but the currents above named are not available to the plaintiff for continuous use in the operation of the said mine; but the plaintiff has been unable to start its machinery or turn it over or to start its motors from the current supplied by the defendant corporations. [15]

XIX.

The defendant corporations have so connected the plaintiff's power lines with their plant that they have placed it beyond the control of the plaintiff to prevent a momentary surge or current in starting their machinery which for an instant draws upon the general supply of electricity at said plant and causes the said circuit-breaker to break the circuit. That the defendants have adopted the following practice in order to harass and annoy the plaintiff in securing the power to which it is entitled: Whenever the circuit-breaker is driven out by a momentary surge of current the defendants refuse to replace the circuit-breaker in place immediately and restore the current, but prohibit their electricians at said plant who are amply competent for that purpose from replacing the circuit-breaker and restoring the current, and refuse to restore the circuit-breaker and current until they are informed at Treadwell, Alaska, a point at least two miles distant from their Sheep Creek power plant and across Gastineau Channel, an arm of the North Pacific Ocean, and then at their convenience send a man across Gastineau Channel in a small boat to restore the circuit-breaker to its place. Plaintiff alleges not only that it is entitled to a reasonable surge for the purpose of starting its machinery so as to consume the continuous current of three hundred horsepower which the defendants undertake to deliver in the said contract; but further allege that if plaintiff was absolutely restricted to an uninterrupted current of 300 horse-power and was provided with

an uninterrupted current of 300 horse-power, the machinery now installed at the Perseverance mine could be started and operated continuously and after the starting thereof much less than 300 horse-power would be consumed. Plaintiff alleges that it is the duty of the defendants to furnish a current of 300 horse-power in such a way that it will be uninterrupted and so divorced from the defendants' other supply of electricity at said plant, that the defendants will not be enabled to make the momentary and involuntary drawing upon said current a pretext for depriving the plaintiff of power.

XX.

The plaintiff alleges that the defendant corporations have not [16] since the 6th day of December, 1912, furnished to the plaintiff at any time the 300 horse-power called for in the said contract, and have failed, at all times, far short of delivery of the same; and further allege that the defendants have failed to provide them with an uninterrupted current of 300 horse-power, but have so arranged their connections with the plaintiff's power line that constant interruptions occur, and insist upon continuing the interruptions at their convenience.

XXI.

Plaintiff respectfully shows to this Court that unless a momentary starting surge sufficient to start the machinery of the plaintiff to a point that it will consume 300 horse-power at the power plant of the defendant corporations, is allowed to this plaintiff, that plaintiff will suffer irreparable injury and damage and that the spirit and intent of the contract

herein set forth will be violated, and that the plaintiff will never be able to enjoy an uninterrupted current of 300 horse-power under the contract as provided for therein.

XXII.

Plaintiff further shows that the damage which plaintiff will sustain by reason of being deprived of said power cannot be estimated and the violations and infringements of the contract on the part of the defendants herein; defendants threaten to continue delay by breaking the circuit as often as possible under the conditions hereinbefore alleged; and that the controversy unless taken cognizance of in [17] equity will cause a multiplicity of suits, and that plaintiff is without plain, speedy and adequate remedy at law and will suffer immediate and irreparable loss, damage and injury in its business unless this Court lends to the aid of the plaintiff its Writ of Injunction and grants to this plaintiff pending a preliminary injunction and restraining order restraining the defendants from the acts for which injunction *pendente lite* is prayed. That the plaintiff cannot secure power from any other source for its operations in the development of Silver Bow Basin, and that there are no power plants adequate to furnish the current required in Silver Bow Basin other than the power plant of the defendant corporations.

WHEREFORE, plaintiff prays:

I.

That the contract herein be specifically enforced both in its letter and in its spirit and intent; and

II.

That the defendants be decreed to furnish to the plaintiff a sufficient amount of electrical horse-power to start its machinery so as to give to plaintiff an effective and uninterrupted use of the full current of 300 horse-power. And, in the alternative, [18]

III.

That the defendants be compelled and decreed to install machinery and appliances in their power plant so as to give to plaintiff a separate and distinct current, uninfluenced by other conditions in the plant, and so as to produce an uninterrupted and uninteruptible current of 300 horse-power; and

IV.

That the plaintiff and defendants herein be decreed to place in the said power plant of the defendant companies proper wattmeters and other appliances for the measurement of the actual horse-power used by the plaintiff; and

V.

That a Restraining Order and Injunction, *pendente lite*, be issued restraining the defendants herein from maintaining the said automatic circuit-breaker or in anywise disconnecting a current of not less than 300 horse-power from the power lines of the plaintiff, and restraining them from interfering with the plaintiff in any way from procuring a sufficient starting load which will make practical and effective use of an uninterrupted current of 300 horse-power; and for such further relief, both permanent and temporary,

as to the Court may seem meet and proper in the premises.

SHACKLEFORD & BAYLESS,
Z. R. CHENEY,

Attorneys for Plaintiff.

United States of America,
District of Alaska,—ss.

B. L. Thane, being first duly sworn, on oath deposes and says: That I am the General Manager of the plaintiff corporation; have read the foregoing complaint, know that the contents thereof [19] and I believe the same to be true.

B. L. THANE.

Subscribed and sworn to before me this 30th day of December, 1912.

[Seal]

W. S. BAYLESS.

Original. No. 968—A. In the District Court for the District of Alaska, Division No. 1, at Juneau. Alaska Gastineau Mining Co., a Corporation, Plaintiff, vs. Alaska Treadwell Gold Mining Company, a Corporation, et als., Defendants. Complaint. Shackleford & Bayless, Attorneys for Plaintiff. Office, Juneau, Alaska. Filed Dec. 30, 1912. E. W. Pettit, Clerk. By H. Malone, Deputy. [20]

*In the District Court for the Territory of Alaska,
Division No. 1, at Juneau.*

Case No. 968-A.

ALASKA GASTINEAU MINING COMPANY, a
Corporation,

Plaintiff,

vs.

ALASKA TREADWELL GOLD MINING COM-
PANY, a Corporation, ALASKA UNITED
GOLD MINING COMPANY, a Corporation;
ALASKA MEXICAN GOLD MINING
COMPANY, a Corporation, and ROBERT
A. KINZIE,

Defendants.

Demurrer.

Come now the defendants and each of them and demur to the complaint of the plaintiff herein for the reasons:

First. That the complaint does not state facts sufficient to constitute a cause of action against said defendants or against either or any of them;

Second. That the Court has no jurisdiction to grant the relief demanded;

Third. That no facts are set up in the complaint under which a court of equity would have jurisdiction to grant the relief asked for or any relief whatsoever against any one or more of the defendants; and

Further that it appears upon the fact of the complaint itself that the plaintiff has a plain, speedy and

adequate remedy at law.

HELLENTHAL & HELLENTHAL,
Attorneys for all the Defendants,

[Endorsed]: Original. No. 968-A. In the District Court for the District of Alaska, Division No. 1. Alaska Gastineau Mining Company, a Corporation, Plaintiff, vs. Alaska Treadwell Gold Mining Company, et al., Defendant. Demurrer. Hellenthal & Hellenthal, Attorneys for Defendants. Office, Juneau, Alaska. Filed Jan. 6, 1913. E. W. Pettit, Clerk. By ———, Deputy. [21]

*In the District Court for the Territory of Alaska,
Division No. 1, at Juneau.*

Case No. 968-A.

ALASKA GASTINEAU MINING COMPANY,
Plaintiff,

vs.

ALASKA TREADWELL GOLD MINING COMPANY, a Corporation, ALASKA UNITED GOLD MINING COMPANY, a Corporation, ALASKA MEXICAN GOLD MINING COMPANY, a Corporation, and R. A. KINZIE,

Defendants.

Answer.

Come now the above-named defendants, and each of them, and for answer to the complaint of the plaintiff herein, admit, deny and allege as follows:

I.

Defendants admit paragraph I of the complaint.

II.

Defendants admit paragraph II of the complaint.

III.

For answer to paragraph III of the plaintiff's complaint the defendants allege that they deny that the International Trust Company was at the time mentioned, or at any other time, the owner of or in control of what is known as the Sheep Creek Power plant, but was in control of a small power plant, then situate near the present site of the Sheep Creek Power plant, which said power plant had the capacity to generate approximately 100 horse-power.

IV.

For answer to paragraph IV of the plaintiff's complaint the defendants aver that they admit the same.

V.

For answer to paragraph V of the plaintiff's complaint the [22] defendants aver that the said International Trust Company and its predecessors were never in control of the Sheep Creek Power plant, but did control as above stated a small power plant of a capacity of approximately 100 horse-power situate near the said Sheep Creek power-plant; as to the balance of the allegations of said paragraph V the defendants aver that while they admit that the International Trust Company at the time named owned some of the appliances mentioned, to wit, the Compressor plant, and the lighting plant, that they have not sufficient knowledge or information concerning said company's ownership as to the balance of the appliances, machines, and property rights mentioned, and therefore deny the allegations touching the same.

VI.

For answer to paragraph VI of the plaintiff's complaint, the defendants aver that at the time mentioned the said International Trust Company did own certain mining claims in and near Silver Bow Basin, but deny the remaining allegations contained in said paragraph.

VII.

For answer to paragraph VII of the plaintiff's complaint, the defendants aver that they deny the same and the whole thereof and each and every allegation therein contained, except as hereinafter qualified, explained or expressly admitted.

VIII.

Referring to paragraph VIII of the plaintiff's complaint, the defendants admit that at the time mentioned F. W. Bradley was the General Consulting Engineer of the defendant companies and possessed the power and authority to act for and in behalf of the said companies, and the defendants further admit that one H. H. Taylor was president of the defendant companies, but as to each [23] and all of the remaining allegations contained in said paragraph the defendants aver that they deny the same, and each and all of them, except as hereinafter expressly admitted, qualified or explained.

IX.

Referring to paragraph IX of the plaintiff's complaint, the defendants allege that they deny each and every allegation therein contained except as hereinafter admitted, qualified or expressly explained.

X.

With reference to paragraph X of the plaintiff's

complaint, the defendants aver that they deny each and every allegation in said paragraph except as hereinafter admitted, qualified or expressly explained.

XI.

For answer to paragraph XI of the plaintiff's complaint, the defendants aver that on or about the date mentioned the contract set up in the complaint relating to the 300 horse-power was assigned by the Oxford Company to the plaintiff company, and that the defendant companies were notified of said assignment; as to each and all of the remaining allegations of said paragraph the defendants aver that they have not sufficient knowledge to form a belief and therefore deny the same.

XII.

Referring to paragraph XII of the plaintiff's complaint, the defendants aver that they have not sufficient knowledge or information to form a belief and therefore deny the same, and each and every allegation therein contained.

XIII.

Referring to paragraph XIII of the plaintiff's complaint, the defendants aver that they have not sufficient knowledge or information concerning the same to form a belief, and therefore deny each and every allegation therein contained. [24]

XIV.

Referring to paragraph XIV of the plaintiff's complaint, the defendants aver that they admit that they were notified of the assignment of the rights of the Oxford Company under the contract set up in

the complaint, and that they were requested to deliver to the plaintiff company the 300 horse-power provided for in the Oxford Contract; and concerning the remaining allegations in said paragraph XIV the defendants deny each and every allegation in said paragraph contained except in so far as the same are hereinafter admitted, qualified or explained.

XV.

Referring to paragraph XV of the plaintiff's complaint, the defendants aver that they deny each and every allegation in said paragraph contained.

XVI.

Referring to paragraph XVI of the plaintiff's complaint, the defendants aver that they deny each and every allegation in said paragraph contained except in so far as the same is hereinafter expressly admitted.

XVII.

Referring to paragraph XVII of the plaintiff's complaint, the defendants deny each and every allegation in said paragraph contained.

XVIII.

Referring to paragraph XVIII of the plaintiff's complaint, the defendants aver that they have not sufficient knowledge and information concerning the matters in said paragraph contained, except such as are hereinafter expressly referred to, and therefore except as to those last mentioned matters defendants deny each and every allegation in said paragraph contained; in relation to the allegations of said paragraph the defendants further aver that [25] they at all times therein mentioned were ready and willing

to furnish the plaintiff at their power-house in Sheep Creek, a full uninterrupted current of 300 horse-power in full compliance with the contract hereinafter referred to.

XIX.

Referring to paragraph XIX of the plaintiff's complaint, the defendants deny each and every allegation in said paragraph contained.

XX.

Referring to paragraph XX of the plaintiff's complaint, the defendants deny each and every allegation in said paragraph contained.

XXI.

Referring to paragraph XXI of the plaintiff's complaint, the defendants deny each and every allegation in said paragraph contained.

XXII.

Referring to paragraph XXII of the plaintiff's complaint, the defendants deny each and every allegation in said paragraph contained.

And the defendants further answering the plaintiff's complaint allege:

I.

That negotiations were had between the defendant corporations and the Oxford Company looking toward the leasing and sale of certain property rights from the Oxford Company to the defendant corporations; that such negotiations terminated in the execution of a written contract between the parties which is in words and figures as follows, to wit: [26]

THIS INDENTURE AND AGREEMENT made and entered into this 14th day of October, 1909, by

and between OXFORD MINING COMPANY hereinafter called the lessor and the Alaska Treadwell Gold Mining Company, the Alaska Mexican Gold Mining Company and the Alaska United Gold Mining Company hereinafter called the lessees.

WITNESSETH,—First, the lessor has this date and does by these presents lease unto the lessees all of the following described real property situated on and near Sheep Creek in the Harris Mining District, District of Alaska, to wit:

The Mexico Mill-site U. S. Mineral Entry No. 25, Lot 71B. The Bellviders Mill-site U. S. Mineral Entry No. 25, lot 72B. The Jumbo Mill-site U. S. Mineral Entry No. 60, lot No. 260. Also that certain piece or parcel of land beginning at a stake identical with post No. 2 Jumbo Mill-site U. S. Survey No. 260 on the meander line of Gastineau Channel, thence first course along the meander line of Gastineau Channel at ordinary high water mark N. 52.00' W. 54 feet to stake No. 2; thence second course N. 48° 15' E. 200 feet to stake No. 3; thence S. 52.00' E. 54 feet to the N. W. side line of Jumbo Mill-site U. S. Survey No. 260 to stake No. 4; thence S. 46° 15' West along the northwest side line Jumbo Mill-site U. S. Survey No. 260, 200 feet to stake No. 1, the place of beginning containing an area of one-quarter of an acre more or less courses expressed from the true meridian, Mag. Var. 29.30'; and also that certain water right known as the Sheep Creek Water Right and located on Sheep Creek about three-quarters of a mile from its mouth, together with the flume and pipe-line connecting the same with the beach near

the mill at the mouth of the said Sheep Creek, also the saw-mill, boarding-house, lumber sheds, wharf landing, mill dam, flumes, penstocks, water-wheels, and all other machinery and appliances used in connection with said saw-mill, situated near the mouth of said Sheep Creek, together with all machinery, tools, equipment, plants of every kind and description now upon said property [27] for a term of ten (10) years from the date hereof at a monthly rental of One Hundred and Twenty-five (\$125.00) Dollars per month, payable in gold coin of the United States on the first day of each month during the term of said lease at the office of the lessees at Treadwell, Alaska; and it is hereby agreed, that if any rent shall be due and unpaid, or if default shall be made in any of the covenants herein contained, that it shall be lawful for the lessor to re-enter said premises and remove all persons therefrom, and the lessees do hereby covenant, promise and agree to pay the lessor the said rent in the manner hereinbefore specified, and not to let or underlet the whole or any part of said premises without a written consent of the lessor, not to assign this lease or any part thereof without said written consent, and at the expiration of said term the party of the second part will quit and surrender said premises in as good state and condition as the same now are.

It is the intention of the Lessees to erect, equip and maintain upon said premises a water-power plant of substantial size and efficiency for the generation of electric power, and if at any time after two (2) years from the date hereof the lessor or its assigns shall elect to take a current

of not to exceed three hundred (300) electric horse-power which shall be taken from and at the generating plant to be installed upon the leased premises hereinbefore described, the lessees undertake covenant and agree to deliver said current to the lessor or its assigns upon the execution and delivery by the lessor or its assigns to the lessee of a deed or deeds conveying said leased property herein described to the party of the second part. If prior to the expiration of nine years from date hereof the lessor does not elect to convey to lessees or their assigns the property herein leased and accept in full consideration therefor the right to use of the three hundred (300) electric horse-power hereinbefore mentioned, the lessees may at their option prior to the expiration of the ten (10) years provided in this lease purchase the property herein leased absolutely from the [28] lessor by paying to the lessor the sum of Twenty-five Thousand dollars (25,000,) in gold coin of the United States; and the lessor covenants and agrees upon tender of said sum of Twenty-five Thousand Dollars (\$25,000,) to execute and deliver such deeds of conveyance to the property herein leased as hereinbefore specified, excepting only as to the title to (1) the one quarter acre tract hereinbefore described and (2) the premises occupied and used by the existing wharf of the lessor to both of which the lessor now asserts only possessory titles. The lessees may at their own cost and expense undertake to perfect the said titles and should lessee wish so to do the lessor shall lend all proper assistance in its power including the using of its name, and should

the said titles be so perfected to the said premises or either of them they shall become the property of the lessor and remain covered by this lease and subject to all terms and conditions thereof.

The covenants herein contained shall be construed as running with the land and as a charge thereon, so, that any successor or successors in interest to the lessor and or lessees who may acquire any interest in and to the titles to the said land shall be bound by this convenance in the same manner as if they had executed this agreement; and the lessees hereof may require at their option that the property herein described be conveyed by the lessor to a responsible trustee for the purpose of carrying out the terms of this agreement, or that deeds and conveyances covering the property herein leased be placed in escrow so as to ensure delivery of the same if required under the provisions of any of the covenants of this lease.

If neither of the options herein provided for are accepted by either the lessor or lessees then the property and rights herein described with all the improvements that are or that may hereafter be placed on the said premises shall be and become the property of the lessor.

The provisions herein as to the delivery of three hundred [29] (300) horse-power at the generating plant to be installed on the premises herein described contemplates the delivery of an uninterrupted current, but the lessees shall not be liable for damages that may arise from operating and physical causes beyond its control.

IN WITNESS WHEREOF the parties have hereunto set their hands and seals the day and year first above written. (Executed in triplicate.)

Witness:

HAROLD LAWRENCE,

WALTER W. BLACK.

OXFORD MINING COMPANY.

By WALLACE HACKETT,

President.

And HENRY ENDICOTT,

Treasurer.

[Seal—Oxford Mining Company]

ALASKA TREADWELL GOLD MINING
COMPANY,

By H. H. TAYLOR,

President.

F. A. HAMMERSMITH,

Secretary.

ALASKA MEXICAN GOLD MINING
COMPANY,

By H. H. TAYLOR,

President.

F. A. HAMMERSMITH,

Secretary.

ALASKA UNITED GOLD MINING COM-
PANY,

By H. H. TAYLOR,

President.

F. A. HAMMERSMITH,

Secretary.

[Seal—Alaska Treadwell Gold Mining Co.]

[Seal—Alaska Mexican Gold Mining Co.]

[Seal—Alaska United Gold Mining Co.]

Commonwealth of Massachusetts,
County of Suffolk,
City of Boston,—ss.

Be it remembered that on this 14th day of October, 1909, before me, the undersigned, a Notary Public, in and for said County and State, personally appeared Wallace Hackett, President, and Henry Endicott, Treasurer, of the Oxford Mining Company, a corporation organized [30] under the laws of the State of Maine, to me known to be the individuals described in and who executed the foregoing instrument as such President and Treasurer; and said Henry Endicott having affixed the seal of said Corporation to said instrument, they severally acknowledged to me that he, Wallace Hackett, as President and he, Henry Endicott, as Treasurer of said Corporation executed the foregoing instrument for and on behalf of said Corporation as the free and voluntary act of said Corporation for the uses and purposes therein set forth. Then the said Henry Endicott, being by me first duly sworn, on his oath states that he is the Treasurer of said Corporation, is acquainted and is the custodian, and has in his possession the corporate seal of said Corporation and that the seal hereinbefore affixed is the corporate seal of said Corporation and was affixed by him as such Treasurer by order of the Board of directors of said Corporation.

In Witness Whereof I have hereunto set my hand and seal the date and year first above written.

[Notarial Seal]

LLOYD A. FROST,

Notary Public.

My commission expires Dec. 5th, 1913.

State of California,

City and County of San Francisco,—ss.

On this 12th day of November in the year one thousand nine hundred and nine, before me, P. J. Kennedy, a Notary Public, in and for said City and County, residing therein, duly commissioned and sworn, personally appeared H. H. Taylor and F. A. Hammersmith, known to me to be the President and Secretary respectively of Alaska Mexican Gold Mining Company and Alaska United Gold Mining Company, the corporations that executed the within *in* foregoing instrument, and to be the officers who executed the said instrument on behalf of said corporations therein named, and they acknowledged to me that such corporations executed the same.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal at my office in the said City and County of San [31] Francisco, the day and year last above written.

(Signed)

[Notarial Seal]

P. J. KENNEDY,

Notary Public, in and for the City and County of San Francisco, State of California.

State of California,

City and County of San Francisco,—ss.

On this 12th day of November in the year One

Thousand Nine Hundred and Nine before me P. J. Kennedy, a Notary Public, in and for said City and County, residing therein, duly commissioned and sworn, personally appeared H. H. Taylor, and F. A. Hammersmith, known to me to be the President and Secretary, respectively, of Alaska Treadwell Gold Mining Company, the Corporation that executed the within and foregoing instrument, and to be the officers who executed the said instrument on behalf of said Corporation therein named, and they acknowledged to me that such Corporation executed the same.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal at my office in said City and County of San Francisco, the day and year last above written.

(Signed)

[Notarial Seal]

P. J. KENNEDY,
Notary Public in and for the City and County of
San Francisco, State of California. [32]

CERTIFIED COPY OF RESOLUTION
PASSED BY THE BOARD OF DIRECT-
ORS OF ALASKA TREADWELL GOLD
MINING COMPANY.

“Resolved that the proposed lease, dated October 14th, 1909, of certain real property particularly therein described and situate on and near Sheep Creek in the Harris Mining District, Alaska, made by and between OXFORD MINING COMPANY and ALASKA TREADWELL GOLD MINING COMPANY, ALASKA MEXICAN GOLD MINING COMPANY and ALASKA UNITED GOLD

MINING COMPANY, be and the same is hereby approved and accepted, and the President and Secretary are hereby authorized and directed, in the name of the company and as its act and deed and under its corporate seal, to execute and deliver said lease to Oxford Mining Company.”

CERTIFICATE OF SECRETARY.

I, F. A. Hammersmith, hereby certify that I am the Secretary of Alaska Treadwell Gold Mining Company; that the foregoing Resolution is a full, true and correct copy of a Resolution duly passed and adopted by the Board of Directors of said Company at a meeting held on the 11th day of November, 1909, as the same is now recorded on the minutes of the meeting of said Board of Directors.

In Witness Whereof I have hereunto set my hand as such Secretary and affixed the corporate seal of said Company, this 11th day of November, 1909.

[Corporate Seal]

(Signed) F. A. HAMMERSMITH,
Secretary of Alaska Treadwell Gold Mining Company.

CERTIFIED COPY OF RESOLUTION PASSED BY THE BOARD OF DIRECTORS OF ALASKA MEXICAN GOLD MINING COMPANY.

“Resolved that the proposed lease dated October 14th, 1909, of certain real property particularly therein described and situate on and near Sheep Creek in the Harris Mining District, Alaska, made by and between Oxford Mining Company and

Alaska Treadwell Gold Mining Company, Alaska Mexican Gold Mining Company and Alaska United Gold Mining Company, be and the same is hereby approved and accepted, and the President and Secretary are hereby authorized and directed, in the name of the Company and as its act and deed and under its corporate seal, to execute and deliver said lease to Oxford Mining Company.”

CERTIFICATE OF SECRETARY.

I, F. A. Hammersmith, hereby certify that I am the Secretary of Alaska Mexican Gold Mining Company; that the foregoing Resolution is a full, true and correct copy of a Resolution duly passed and adopted by the Board of Directors of said Company at a meeting held on the 11th day of November, 1909, as the same is now recorded on the minutes of the meeting of said Board of Directors.

In Witness Whereof I have hereunto set my hand as such Secretary and affixed the corporate seal of said Company, this 11th day of November, 1909.

[Corporate Seal]

(Signed) F. A. HAMMERSMITH,
Secretary of Alaska Mexican Gold Mining Company.

CERTIFIED COPY OF RESOLUTION PASSED BY THE BOARD OF DIRECTORS OF ALASKA UNITED GOLD MINING COMPANY.

“Resolved that the proposed lease, dated October 14th, 1909, of [33] certain real property particularly therein described and situated on and near

Sheep Creek in the Harris Mining District, Alaska, made by and between Oxford Mining Company and Alaska Treadwell Gold Mining Company, Alaska Mexican Gold Mining Company and Alaska United Gold Mining Company, be and the same is hereby approved and accepted and the President and Secretary are hereby authorized and directed, in the name of the company and as its act and deed and under its corporate seal, to execute and deliver said lease to Oxford Mining Company.”

CERTIFICATE OF SECRETARY.

I, F. A. Hammersmith, hereby certify that I am the Secretary of Alaska United Gold Mining Company; that the foregoing Resolution is a full, true and correct copy of a Resolution duly passed and adopted by the Board of Directors of said Company at a meeting held on the 11th day of November, 1909, as the same is now recorded on the minutes of the meeting of said Board of Directors.

IN WITNESS WHEREOF I have hereunto set my hand as such Secretary and affixed the corporate seal of said Company, this 11th day of November, 1909.

[Corporate Seal]

(Signed) F. A. HAMMERSMITH,
Secretary of Alaska United Gold Mining Company.

Commonwealth of Massachusetts,
County of Suffolk,
City of Boston,—ss.

WHEREAS the International Trust Company,

a corporation, has reserved unto itself for the benefit of itself and various persons therein interested a lien upon the property described in the foregoing lease for the sum of \$36,376, to secure the costs, advances, and charges in connection with the foreclosure of certain trust deeds upon certain property in the District of Alaska, a part of which is described in the foregoing instrument.

NOW, THEREFORE, THIS INSTRUMENT WITNESSETH

That in consideration of the covenants contained in the foregoing agreement said International Trust Company for the purpose of binding the interest so held upon said property by said lien, assents, agrees and ratifies the execution of the foregoing lease with the Alaska Treadwell Gold Mining Company, et al., Party of the Second part, and agrees to substitute said lien upon any contract or contracts which may be made pursuant to the options contained in the said lease, so that the terms and provisions of said contract may be carried out.

Executed in triplicate.

Signed this 14th day of October, 1909.

[Corporate Seal]

INTERNATIONAL TRUST COMPANY,

By JNO. M. GRAHAM,

Pres.

HENRY L. JEWETT,

Sect.

Witness:

WALTER W. BLACK,

HAROLD LAWRENCE.

Commonwealth of Massachusetts,
County of Suffolk,
City of Boston,—ss.

Be it remembered that on the 14th day of October, 1909, before me, the undersigned Notary Public, in and for said county and State personally appeared John M. Graham and Henry L. Jewett, Secretary of the International Trust Company, a corporation organized under the laws of the State of Massachusetts, to me known to be the individuals described in and who executed the foregoing instrument, as such President and Secretary for and on behalf of said International Trust Company as Trustee for the mortgage bondholders [34] under said instrument described; the said Henry L. Jewett having affixed the seal of said corporation to said instrument and they severally acknowledged to me that he, John M. Graham as president, and he, the said Henry L. Jewett, as Secretary of said Corporation, executed the foregoing instrument for and on behalf of said corporation as the free and voluntary act and deed of said corporation as Trustees for the uses and purposes therein set forth.

Then the said Henry L. Jewett being by me first duly sworn on his oath states that he is the Secretary of said Corporation, is acquainted, is the custodian, and has in his possession the corporate seal of said corporation and that the seal hereinbefore affixed is the corporate seal of said corporation and was affixed by him as such Secretary by order of the Board of Directors of said Corporation.

II.

That thereafter further negotiations were had between the Oxford Mining Company and the defendant Corporations in relation [35] to the properties mentioned in the foregoing instrument, which said negotiations resulted in the execution of a further instrument in writing made between the parties, which said instrument is in words and figures as follows, to wit:

THIS INDENTURE, made this 22nd day of April, 1911, BETWEEN the OXFORD MINING COMPANY, a corporation, hereinafter called the party of the first part, and the Alaska Treadwell Gold Mining Company, a corporation, the Alaska Mexican Gold Mining Company, a corporation, and the Alaska United Gold Mining Company, a corporation, hereinafter called the parties of the second part;

WITNESSETH:

THAT WHEREAS, on the 14th day of October, 1909, the parties of the first and second parts above mentioned, entered into an indenture and agreement in words and figures as follows, to wit: [36]

THIS INDENTURE AND AGREEMENT made and entered into this 14th day of October, 1909, by and between OXFORD MINING COMPANY hereinafter called the lessor and the ALASKA TREADWELL GOLD MINING Company, the Alaska Mexican Gold Mining Company and the Alaska United Gold Mining Company hereinafter called the lessees.

WITNESSETH,—First, the lessor has this date

and does by these presents lease unto the lessees all of the following described real property situated on and near Sheep Creek in the Harris Mining District, District of Alaska to wit:

The Mexico Mill-site U. S. Mineral Entry No. 25, lot 71B. The Bellvidere Mill-site U. S. Mineral Entry No. 25 lot 72B. The Jumbo Mill-site U. S. Mineral Entry No. 60, lot No. 260. Also that certain piece or parcel of land beginning at a stake identical with post No. 2 Jumbo Mill-site U. S. Survey No. 260 on the meander line of Gastineau Channel, thence first course along the meander line of Gastineau Channel at ordinary high water mark N. 52.00' W 54 feet to stake No. 2; thence second course N. 48° 15' E. 200 feet to stake No. 3; thence S. 52.00' E. 54 feet to the N. W. side line of Jumbo Mill-site U. S. Survey No. 260 to stake No. 4; thence S. 46 15' West along the Northwest side line Jumbo Mill-site U. S. Survey No. 260, 200 feet to stake No. 1, the place of beginning containing an area of one quarter of an acre more or less courses expressed from the true meridian, Mag. Var. 29.30'; and also that certain water right known as the Sheep Creek Water Right and located on Sheep Creek about three quarters of a mile from its mouth, together with the flume and pipe line connecting the same with the beach near the mill at the mouth of the said Sheep Creek, also the sam-mill, boarding house, lumber sheds, wharf landing, mill dam flumes, penstocks, water-wheels, and all other machinery and appliances used in connection with said saw-mill, situated near the mouth of said

Sheep Creek, together with all machinery, tools, equipment, plants of every kind and description now upon said property for a term of ten (10) years from the date hereof at a monthly [37] rental of One Hundred and Twenty-five (\$125.00) Dollars per month payable in gold coin of the United States on the first day of each month during the term of said lease at the office of the lessees at Treadwell, Alaska; and it is hereby agreed, that if any rent shall be due and unpaid, or if default shall be made in any of the covenants herein contained, that it shall be lawful for the lessor to re-enter said premises and remove all persons therefrom, and the lessees do hereby covenant, promise and agree to pay the lessor the said rent in the manner hereinbefore specified, and not to let or under let the whole or any part of said premises without a written consent of the lessor, nor to assign this lease or any part thereof without said written consent, and at the expiration of said term the party of the second part will quit and surrender said premises in as good state and condition as the same now are.

It is the intention of the lessees to erect, equip and maintain upon said premises a water-power plant of substantial size and efficiency for the generation of electric power, and if at any time after two (2) years from the date hereof the lessor or its assigns shall elect to take a current of not to exceed three hundred (300) electric horse-power which shall be taken from and at the generating plant to be installed upon the leased premises hereinbefore described, the lessees undertake covenant and agree to deliver said

current to the lessor or its assigns upon the execution and delivery by the lessor or its assigns to the lessee of a deed or deeds conveying said leased property herein described to the party of the second part. If prior to the expiration of nine years from the date hereof the lessor does not elect to convey to lessees or their assigns the property herein leased and accept in full consideration therefor the right to the use of the three hundred (300) electric horse-power hereinbefore mentioned, the lessees may at their option prior to the expiration of the ten (10) years provided in this lease purchase the property herein leased absolutely from the lessor by paying to the lessor the sum of Twenty-five Thousand [38] Dollars (25,000.) in gold coin of the United States; and the lessor covenants and agrees upon tender of said sum of Twenty-five Thousand Dollars (\$25,000.00) to execute and deliver such deeds of conveyance to the property herein leased as hereinbefore specified, excepting only as to the title to (1) the one quarter acre tract hereinbefore described and (2) the premises occupied and used by the existing wharf of the lessor to both of which the lessor now asserts only possessory titles. The lessees may at their own cost and expense undertake to perfect the said titles and should lessee wish so to do the lessor shall lend all proper assistance in its power including the using of its name, and should the said titles be so perfected to the said premises or either of them they shall become the property of the lessor and remain covered by this lease and subject to all terms and conditions thereof.

The covenants herein contained shall be construed as running with the land and as a charge thereon, so, that any successor or successors, in interest to the lessor and or lessees who may acquire any interest in and to the titles to the said land shall be bound by this conveyance in the same manner as if they had executed this agreement; and the lessees hereof may require at their option that the property herein described be conveyed by the lessor to a responsible Trustee for the purpose of carrying out the terms of this agreement, or that deeds and conveyances covering the property herein leased be placed in escrow so as to ensure delivery of the same if required under the provisions of any of the covenants of this lease.

If neither of the options herein provided for are accepted by either the lessor or lessees then the property and lights herein described with all the improvements that are or that may hereafter be placed on the said premises shall be and become the property of the lessor.

The provisions herein as to the delivery of three hundred (300) horse power at the generating plant to be installed on the premises herein described contemplates the delivery of an uninterrupted current, but the lessees shall not be liable for damages that may arise from operating and physical causes beyond its control.

IN WITNESS WHEREOF the parties hereto have hereunto set their hands and seals the day and

year first above written. (Executed in triplicate.)

Witness:

HAROLD LAWRENCE.

WALTER W. BLACK.

OXFORD MINING COMPANY.

By WALLACE HACKETT,

President.

And HENRY ENDICOTT,

Treasurer.

[Seal—Oxford Mining Company.]

ALASKA TREADWELL GOLD MINING
COMPANY.

By H. H. TAYLOR,

President,

F. A. HAMMERSMITH,

Secretary.

ALASKA MEXICAN GOLD MINING
COMPANY.

By H. H. TAYLOR,

President,

F. A. HAMMERSMITH,

Secretary.

ALASKA UNITED GOLD MINING COM-
PANY.

By H. H. TAYLOR,

President,

F. A. HAMMERSMITH,

Secretary.

[Seal—Alaska Treadwell Gold Mining Co.]

[39]

[Seal—Alaska Mexican Gold Mining Co.]

[Seal—Alaska United Gold Mining Co.]

Commonwealth of Massachusetts,
County of Suffolk,
City of Boston,—ss.

Be it remembered that on this 14th day of October, 1909, before me, the undersigned, a Notary Public, in and for said County and State, personally appeared Wallace Hackett, President, and Henry Endicott, Treasurer, of the Oxford Mining Company, a corporation, organized under the laws of the State of Maine, to me known to be the individuals described in and who executed the foregoing instrument as such president and such Treasurer; and said Henry Endicott having affixed the seal of said Corporation to said instrument, *the* severally acknowledged to me that he, Wallace Hackett, as President and he, Henry Endicott, as Treasurer, of said Corporation executed the foregoing instrument for and on behalf of said Corporation, as the free and voluntary act of said Corporation for the uses and purposes therein set forth. Then the said Henry Endicott, by me being first duly sworn, on his oath states that he is the Treasurer of said Corporation, is acquainted and is the custodian, and has in his possession the corporate seal of said Corporation and that the seal hereinbefore affixed is the corporate seal of said Corporation and was affixed by him as such Treasurer by order of the Board of Directors of said Corporation.

In Witness Whereof I have hereunto set my hand and seal the date and year first above written.

[Notarial Seal]

(Signed) LLOYD A. FROST,
Notary Public.

My commission expires Dec. 5th, 1913.

State of California,
City and County of San Francisco,—ss.

On this 12th day of November, in the year one thousand nine hundred and nine, before me, P. J. Kennedy, a Notary Public, in and for the said City and County, residing therein, duly commission and sworn, personally appeared H. H. Taylor and F. A. Hammersmith known to me to be the President and Secretary respectively of Alaska Mexican Gold Mining Company and Alaska United Gold Mining Company, the corporations that executed the within and foregoing instrument, and to be the officers who executed the said instrument on behalf of said Corporations therein named, and they acknowledged to me that such corporations executed the same.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal at my office in the said City and County of San Francisco the day and year last above written.

[Notarial Seal]

(Signed) P. J. KENNEDY,
Notary Public in and for the City and County of
San Francisco, State of Calif.

State of California,
City and County of San Francisco,—ss.

On this 12th day of November in the year One Thousand Nine Hundred and Nine, before me, P. J. Kennedy, a Notary Public, [40] in and for said City and County, residing therein, duly commission and sworn, personally appeared H. H. Taylor and F. A. Hammersmith, know to me to be the

President and Secretary, respectively, of Alaska Treadwell Gold Mining Company, the corporation that executed the within and foregoing instrument, and to be the officers who executed the said instrument on behalf of said corporation therein named, and they acknowledged to me that such corporation executed the same.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal at my office in said City and County of San Francisco, the day and year last above written.

[Notarial Seal]

(Signed) P. J. KENNEDY,
Notary Public in and for the City and County of
San Francisco, State of California. [41]

**CERTIFIED COPY OF RESOLUTION PASSED
BY THE BOARD OF DIRECTORS OF
ALASKA TREADWELL GOLD MINING
COMPANY.**

“Resolved that the proposed lease, dated October 14th, 1909, of certain real property particularly therein described and situate on and near Sheep Creek in the Harris Mining District, Alaska, made by and between Oxford Mining Company and Alaska Treadwell Gold Mining Company, Alaska Mexican Gold Mining Company and Alaska United Gold Mining Company, be and the same is hereby approved and accepted, and the President and Secretary are hereby authorized and directed, in the name of the Company and as its act and deed and under its corporate seal, to execute and deliver said lease to Oxford Mining Company.”

CERTIFICATE OF SECRETARY.

I, F. A. Hammersmith, hereby certify that I am the Secretary of Alaska Treadwell Gold Mining Company; that the foregoing Resolution is a full, true and correct copy of a Resolution duly passed and adopted by the Board of Directors of said Company at a meeting held on the 11th day of November, 1909, as the same is now recorded on the minutes of the meeting of said Board of Directors.

IN WITNESS WHEREOF I have hereunto set my hand as such Secretary and affixed the corporate seal of said Company, this 11th day of November, 1909.

[Corporate Seal]

(Signed) F. A. HAMMERSMITH,
Secretary of Alaska Treadwell Gold Mining Company.

**CERTIFIED COPY OF RESOLUTION PASSED
BY THE BOARD OF DIRECTORS OF
ALASKA MEXICAN GOLD MINING COM-
PANY.**

“Resolved that the proposed lease dated October 14th, 1909, of certain real property particularly therein described and situate on and near Sheep Creek in the Harris Mining District, Alaska, made by and between Oxford Mining Company and Alaska Treadwell Gold Mining Company, Alaska Mexican Gold Mining Company and Alaska United Gold Mining Company, be and the same is hereby approved and accepted, and the President and Secretary are hereby authorized and directed, in the name of the Company and as its act and deed and under its

corporate seal, to execute and deliver said lease to Oxford Mining Company.”

CERTIFICATE OF SECRETARY.

I, F. A. Hammersmith, hereby certify that I am the Secretary of Alaska Mexican Gold Mining Company; that the foregoing Resolution is a full, true and correct copy of a Resolution duly passed and adopted by the Board of Directors of said Company at a meeting held on the 11th day of November, 1909, as the same is now recorded on the minutes of the meeting of said Board of Directors.

In Witness Whereof I have hereunto set my hand as such Secretary and affixed the corporate seal of said Company, this 11th day of November, 1909.

[Corporate Seal]

(Signed) F. A. HAMMERSMITH,
Secretary of Alaska Mexican Gold Mining Company.

**CERTIFIED COPY OF RESOLUTION PASSED
BY THE BOARD OF DIRECTORS OF
ALASKA UNITED GOLD MINING COM-
PANY.**

“Resolved that the proposed lease, dated October 14, 1909, of [42] certain real property particularly therein described and situated on and near Sheep Creek in the Harris Mining District, Alaska, made by and between Oxford Mining Company and Alaska Treadwell Gold Mining Company, Alaska Mexican Gold Mining Company and Alaska United Gold Mining Company, be and the same is hereby approved and accepted and the President and Secretary are hereby authorized and directed, in the name

of the company and as its act and deed and under its corporate seal, to execute and deliver said lease to Oxford Mining Company.”

CERTIFICATE OF SECRETARY.

I, F. A. Hammersmith, hereby certify that I am the Secretary of Alaska United Gold Mining Company; that the foregoing Resolution is a full, true and correct copy of a Resolution duly passed and adopted by the Board of Directors of said Company at a meeting held on the 11th day of November, 1909, as the same is now recorded on the minutes of the meeting of said Board of Directors.

In Witness Whereof I have hereunto set my hand as such Secretary and affixed the corporate seal of said Company, this 11th day of November, 1909.

[Corporate Seal]

(Signed) F. A. HAMMERSMITH,
Secretary of Alaska United Gold Mining Company.
Commonwealth of Massachusetts,
County of Suffolk,
City of Boston,—ss.

WHEREAS the International Trust Company, a corporation, has reserved unto itself for the benefit of itself and various persons therein interested a lien upon the property described in the foregoing lease for the sum of \$36,376. to secure the costs, advances, and charges in connection with the foreclosure of certain trust deeds upon certain property in the District of Alaska, a part of which is described in the foregoing instrument.

NOW THEREFORE THIS INSTRUMENT WITNESSETH That in consideration of the cov-

enants contained in the foregoing agreement said International Trust Company for the purpose of binding the interest so held upon said property by said lien assents, agrees and ratifies the execution of the foregoing lease with the Alaska Treadwell Gold Mining Company et al., party of the Second part, and agrees to substitute said lien upon any contract or contracts, which may be made pursuant to the options contained in the said lease, so that the terms and provisions of said contract may be carried out. (Executed in triplicate.)

Signed this 14th day of October, 1909.

INTERNATIONAL TRUST COMPANY.

[Corporate Seal] By JNO. M. GRAHAM,
Pres.
HENRY L. JEWETT,
Sect.

Witness:

WALTER W. BLACK.
HAROLD LAWRENCE.

Commonwealth of Massachusetts,
County of Suffolk,
City of Boston,—ss.

Be it remembered that on the 14th day of October, 1909, before me, the undersigned Notary Public, in and for said County and State personally appeared John M. Graham and Henry L. Jewett, Secretary of the International Trust Company, a corporation organized under the laws of the State of Massachusetts, to me known to be the individuals described in and who executed the foregoing instrument, as such President and Secretary for and on behalf of said

International Trust Company as Trustee for the mortgage bondholders [43] under said instrument described; the said Henry L. Jewett having affixed the seal of said corporation to said instrument and they severally acknowledged to me that he, John M. Graham as president, and he, the said Henry L. Jewett, as Secretary of said Corporation, executed the foregoing instrument for and on behalf of said corporation as the free and voluntary act and deed of said corporation as Trustees for the uses and purposes therein set forth.

Then the said Henry L. Jewett being by me first duly sworn on his oath states that he is the Secretary of said Corporation, is acquainted, is the custodian, and has in his possession the corporate seal of said corporation and that the seal hereinbefore affixed is the corporate seal of said corporation and was affixed by him as such Secretary by order of the Board of Directors of said Corporation.

IN WITNESS WHEREOF I have hereunto set my hand and official seal the day and year first above written.

[Notarial Seal]

(Signed) LLOYD A. FROST,
Notary Public.

My commission expires Dec. 5th, 1913.

Commonwealth of Massachusetts,
County of Suffolk,
City of Boston,—ss.

WHEREAS the International Trust Company a corporation has reserved a lien upon the property

described in the foregoing lease together with other property.

Now for the purpose of further securing said lien, the undersigned lessor in the foregoing instrument, by order of its Board of Directors, hereby assigns the rentals due or to become due under the foregoing lease to the International Trust Company to be applied, first upon the payment of interest of the \$15,000. item a compensation reserved in favor of said Trust Company at the rate of six per cent (6% per annum—and second that the balance of said moneys be applied pro rata upon the other items described in said lien so reserved.

Dated this 14th day of October, 1909, at Boston, Mass.

(Signed) OXFORD MINING COMPANY,
By WALLACE HACKETT,
President.

Attest:

HENRY ENDICOTT,
Secretary.

—which said agreement was duly filed for record at 1 o'clock P. M. on the 17th day of October, 1910, and duly recorded in Book 19 Miscellaneous, at page 2 of the records of the Juneau Recording District, wherein the property mentioned in said indenture and agreement is situated:

AND WHEREAS, on or about the 17th day of October, 1910, the parties of the second part had finished the erection and equipment upon the premises described in the said indenture and agreement of a water-power plant of substantial size and

efficiency pursuant to the provisions of said indenture and agreement and had expended in the erection and equipment of said water-power plant a sum in excess of one Hundred Thousand (\$100,000) Dollars:

AND WHEREAS, the said water-power plant was completed about one year sooner than contemplated in the said indenture and agreement of October 14, 1909, which allowed a period of two years from the date of said agreement for the erection of said water-power plant: [44]

AND WHEREAS, thereafter on the 31st day of October, 1909, the Oxford Mining Company, party of the first part therein, duly elected to take the electric current provided for in the said indenture and agreement, which said election was accepted and agreed to by the parties of the second part hereinbefore mentioned on the said 31st day of October, 1910;

NOW, THEREFORE, under and pursuant to the provisions of the indenture and agreement of October 14, 1909, and the election of the party of the first part of October 31, 1910, the party of the first part, for and in consideration of the provisions of the said indenture and agreement of October 14, 1909, and pursuant to its election of October 31st, 1910; and in further consideration of the sum of One Hundred Thousand (\$100,000) Dollars expended in the erection and equipment of a water power plant of sufficient size and efficiency for the generation of electric power by the parties of the second part hereto, receipt of all of which consid-

erations above set forth is hereby acknowledged by the party of the first part, does by these presents grant, bargain and sell unto the parties of the second part, and to their heirs, assigns and successors in interest, forever, all of that certain property described in the said indenture and agreement of October 14, 1909, hereinbefore set forth, lying and being situate on and near Sheep Creek in the Harris Mining District, District of Alaska.

TOGETHER *will* all the tenements, hereditaments and appurtenances hereunto belonging or appertaining, and the reversion and reversions, remainder and remainders rents, issues and profits thereof, it being the intention of this instrument in conveying to comply in full with the undertaking on the part of the Oxford Mining Company made on the 14th day of October, 1909.

TO HAVE AND TO HOLD said premises together with the appurtenances unto the said parties of the second part and to their heirs, assigns and successors in interest forever.

IN WITNESS WHEREOF, the parties hereto have hereunto set their hands and seals the day and year first above written.

(Signed) OXFORD MINING COMPANY,
By WALLACE HACKETT,
President.

[Corporate Seal] HENRY ENDICOTT,
Treasurer.

Signed, sealed and delivered in the presence of
LEWIS P. SHACKLEFORD,
L. W. LAWRENCE (or L. W. LANS-
MORE).

Commonwealth of Massachusetts,
County of Suffolk,
City of Boston,—ss.

It will be remembered that on the twenty-second day of April, 1911, before me Alexander L. Pelkey, Notary Public in and for said State, County and City, personally appeared WALLACE HACKETT, president and HENRY ENDICOTT, treasurer of the Oxford Mining Company, a corporation organized under the laws of the State of Maine, known to me to be the individuals described in and who executed the foregoing instrument as said President and Treasurer, and the said Henry Endicott, having affixed the seal of said corporation to said instrument, they severally acknowledged to me that WALLACE HACKETT as President and HENRY ENDICOTT as Treasurer of the said corporation executed the foregoing instrument for and on behalf of said corporation to be the free and voluntary act of said corporation for the uses and purposes therein set forth. Then said HENRY ENDICOTT, being first duly sworn, on his oath states that he is the Treasurer of said corporation and he is acquainted with, is custodian of and has in his possession the corporate seal of said corporation, and that the seal [45] hereinbefore affixed is the seal of said corporation and was affixed by him as said Treasurer by order of the Board of Directors of said Corporation.

IN WITNESS WHEREOF I have herein set my

hand and official seal the day and year first above written.

[Notarial Seal]

(Signed) ALEXANDER L. PELKEY,
Notary Public. [46]

III.

That thereafter other and further negotiations were had by and between the Oxford Mining Company and the defendant corporations in relation to the property rights above referred to, which said negotiations resulted in the execution between the parties of another and further instrument, which is in words and figures as follows, to wit: [47]

THIS AGREEMENT, made this 22d day of April, 1911, BETWEEN the Oxford Mining Company, a corporation, party of the first part, and the Alaska Treadwell Gold Mining Company, a corporation, the Alaska Mexican Gold Mining Company, a corporation, and the Alaska United Gold Mining Company, a corporation, parties of the second part: WITNESSETH:

THAT WHEREAS, on the 14th day of October, 1909, the parties hereto entered into an indenture and agreement in words and figures as follows, to wit: [48]

THIS INDENTURE AND AGREEMENT made and entered into this 14th day of October, 1909, by and between OXFORD MINING COMPANY hereinafter called the lessor and the Alaska Treadwell Gold Mining Company, the Alaska Mexican Gold Mining Company and the Alaska United Gold Mining Company hereinafter called the lessees.

WITNESSETH,—First, the lessor has this date

and does by these presents lease unto the lessees all of the following described real property situated on and near Sheep Creek in the Harris Mining District, District of Alaska to wit:

The Mexico Mill-site U. S. Mineral Entry No. 25, lot 71B. The Bellvidere Millsite U. S. Mineral Entry No. 25, Lot 72B. The Jumbo Mill-site U. S. Mineral Entry No. 60, lot No. 260. Also that certain piece or parcel of land beginning at a stake indential with post No. 2 Jumbo Mill-site U. S. Survey No. 260 on the meander line of Gastineau Channel, thence first course along the meander line of Gastineau Channel at ordinary high water mark N. 52.00' W 54 feet to stake No. 2; thence second course N. 48° 15' E. 200 feet to stake No. 3; thence S. 52.00' E. 54 feet to the N. W. side line of Jumbo Mill-site U. S. Survey No. 260 to stake No. 4; thence S. 46 15' West along the Northwest side line Jumbo Mill-site U. S. Survey No. 260, 200 feet to stake No. 1, the place of beginning containing an area of one quarter of an acre more or less courses expressed from the true meridian, Mag. Var. 29.30'; and also that certain water right known as the Sheep Creek Water Right and located on Sheep Creek about three quarters of a mile from its mouth, together with the flume and pipe-line connecting the same with the beach near the mill at the mouth of the said Sheep Creek, also the saw-mill, boarding house, lumber sheds, wharf landing, mill dam flumes, pen-stocks, water-wheels, and all other machinery and appliances used in connection with said saw-mill, situated near the mouth of said Sheep Creek, to-

gether with all machinery, tools, equipment, plants of every kind and description now upon said property for a term of ten (10) years from the date hereof at a monthly rental of One Hundred and Twenty-five (\$125.00) Dollars per month, payable in gold coin of the United States on the first day of each month during the term of said lease at the office of the lessees at Treadwell, Alaska; and it is hereby agreed, that if any rent shall be due and unpaid, or if default shall be made in any of the covenants herein contained, that it shall be lawful for the lessor to re-enter said premises and remove all persons therefrom, and the lessees do hereby covenant, promise and agree to pay the lessor the said rent in the manner hereinbefore specified, and not to let or under let the whole or any part of said premises without a written consent of the lessor, nor to assign this lease or any part thereof without said written consent, and at the expiration of said term the party of the second part will quit and surrender said premises in as good state and condition as the same now are.

It is the intention of the Lessees to erect, equip and maintain upon said premises a water-power plant of substantial size and efficiency for the generation of electric power, and if at any time after two (2) years from the date hereof the lessor or its assigns shall elect to take a current of not to exceed three hundred (300) electric horse-power which shall be taken from and at the generating plant to be installed upon the leased premises hereinbefore described, the lessees undertake covenant and agree

to deliver said current to the lessor or its assigns upon the execution and delivery by the lessor or its assigns to the lessee of a deed or deeds conveying said leased property herein described to the party of the second part. If prior to the expiration of nine years from the date hereof the lessor does not elect to convey to lessees or their assigns the property herein leased and accept in full consideration therefor the right to the use of the three hundred (300) electric horse-power hereinbefore mentioned, the lessees may at [49] their option prior to the expiration of the ten (10) years provided in this lease purchase the property herein leased absolutely from the lessor by paying to the lessor the sum of Twenty-five Thousand Dollars (\$25,000) in gold coin of the United States; and the lessor covenants and agrees upon tender of said sum of Twenty-five Thousand Dollars (\$25,000) to execute and deliver such deeds of conveyance to the property herein leased as hereinbefore specified, excepting only as to the title to (1) the one quarter acre tract hereinbefore described and (2) the premises occupied and used by the existing wharf of the lessor to both of which the lessor now asserts only possessory titles. The lessees may at their own cost and expense undertake to perfect the said titles and should lessee wish so to do the lessor shall lend all proper assistance in its power including the using of its name, and should the said titles be so perfected to the said premises or either of them they shall become the property of the lessor and remain covered by this lease and subject to all terms and

conditions thereof.

The covenants herein contained shall be construed as running with the land and as a charge thereon, so, that any successor or successors in interest to the lessor and or lessees who may acquire any interest in and to the titles to the said land shall be bound by this conveyance in the same manner as if they had executed this agreement; and the lessees hereof may require at their option that the property herein described be conveyed by the lessor to a responsible Trustee for the purpose of carrying out the terms of this agreement, or that deeds and conveyances covering the property herein leased be placed in escrow so as to ensure delivery of the same if required under the provisions of any of the covenants of this lease.

If neither of the options herein provided for are accepted by either the lessor or lessees then the property and rights herein described with all the improvements that are or that may hereafter be placed on the said premises shall be and become the property of the lessor.

The provisions herein as to the delivery of three hundred (300) horse-power at the generating plant to be installed on the premises herein described contemplates the delivery of an uninterrupted current, but the lessees shall not be liable for damages that may arise from operating and physical causes beyond its control.

In witness whereof the parties hereto have hereunto set their hands and seals the day and year first

above written. (Executed in Triplicate.)

Witness:

HAROLD LAWRENCE.

WALTER W. BLACK.

OXFORD MINING COMPANY.

By WALLACE HACKETT,
President.

And HENRY ENDICOTT,
Treasurer,

[Seal—Oxford Mining Company.]

ALASKA TREADWELL GOLD MINING
COMPANY.

By H. H. TAYLOR,
President.

F. A. HAMMERSMITH,
Secretary.

ALASKA MEXICAN GOLD MINING
COMPANY.

By H. H. TAYLOR,
President.

F. A. HAMMERSMITH,
Secretary.

ALASKA UNITED GOLD MINING COM-
PANY.

H. H. TAYLOR,
President.

F. A. HAMMERSMITH,
Secretary.

[Seal—Alaska Treadwell Gold Mining Co.]

[Seal—Alaska Mexican Gold Mining Co.]

[Seal—Alaska United Gold Mining Co.]

Commonwealth of Massachusetts,
County of Suffolk,
City of Boston,—ss.

Be it remembered that on this 14th day of October, 1909, before me, the undersigned, a Notary Public, in and for said County and State, personally appeared Wallace Hackett, President, and Henry Endicott, Treasurer, of the Oxford Mining Company, a corporation, organized under the laws of the State of Maine, to me known to be the individuals described in and who executed the foregoing instrument as such President and such Treasurer; and said Henry Endicott having affixed the seal of said corporation to said instrument, *the* severally acknowledged to me that he, Wallace Hackett, as President and he, Henry Endicott, as Treasurer, of said Corporation executed the foregoing instrument for and on behalf of said Corporation, as the free and voluntary act of said Corporation for the uses and purposes therein set forth. Then the said Henry Endicott, by me being first duly sworn, on his oath states that he is the Treasurer of said Corporation, is acquainted and is the custodian, and has in his possession the corporate seal of said Corporation and that the seal hereinbefore affixed is the corporate seal of said Corporation and was affixed by him as such Treasurer by order of the Board of Directors of said Corporation.

In witness Whereof I have hereunto set my hand and seal the date and year first above written.

[Notarial Seal.]

(Signed) LLOYD A. FROST,
Notary Public.

My commission expires Dec. 5th, 1913.

State of California,

City and County of San Francisco,—ss.

On this 12th day of November, in the year one thousand nine hundred and nine, before me, P. J. Kennedy, a Notary Public, in and for the said City and County, residing therein, duly commission and sworn, personally appeared H. H. Taylor and F. A. Hammersmith known to me to be the President and Secretary respectively of Alaska Mexican Gold Mining Company and Alaska United Gold Mining Company, the corporation that executed the within and foregoing instrument, and to be the officers who executed the said instrument on behalf of said Corporations therein named, and they acknowledged to me that such corporations executed the same.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal at my office in the said City and County of San Francisco, the day and year last above written.

[Notarial Seal.]

(Signed) P. J. KENNEDY,
Notary Public in and for the City and County of San
Francisco, State of Calif.

State of California,

City and County of San Francisco,—ss.

On this 12th day of November in the year One

Thousand Nine Hundred and Nine, before me, P. J. Kennedy, a Notary Public, [51] in and for said City and County, residing therein, duly commission and sworn, personally appeared H. H. Taylor and F. A. Hammersmith, known to me to be the President and Secretary, respectively, of Alaska Treadwell Gold Mining Company, the corporation that executed the within and foregoing instrument, and to be the officers who executed the said instrument on behalf of said Corporation therein named, and they acknowledged to me that such corporation executed the same.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal at my office in said City and County of San Francisco, the day and year last above written.

[Notarial Seal.]

(Signed) P. J. KENNEDY,

Notary Public in and for the City and County of San Francisco, State of California. [52]

CERTIFIED COPY OF RESOLUTION PASSED
BY THE BOARD OF DIRECTORS OF
ALASKA TREADWELL GOLD MINING
COMPANY.

“Resolved that the proposed lease, dated October 14th, 1909, of certain real property particularly therein described and situate on and near Sheep Creek in the Harris Mining District, Alaska, made by and between Oxford Mining Company and Alaska Treadwell Gold Mining Company, Alaska Mexican Gold Mining Company and Alaska United Gold Mining Company, be and the same is hereby

approved and accepted, and the President and Secretary are hereby authorized and directed, in the name of the Company and as its act and deed and under its corporate seal, to execute and deliver said lease to Oxford Mining Company.”

CERTIFICATE OF SECRETARY.

I, F. A. Hammersmith, hereby certify that I am the Secretary of Alaska Treadwell Gold Mining Company; that the foregoing Resolution is a full, true and correct copy of a Resolution duly passed and adopted by the Board of Directors of said Company at a meeting held on the 11th day of November, 1909, as the same is now recorded on the minutes of the meeting of said Board of Directors.

IN WITNESS WHEREOF I have hereunto set my hand as such Secretary and affixed the corporate seal of said Company, this 11th day of November, 1909.

[Corporate Seal.]

(Signed) F. A. HAMMERSMITH,
Secretary of Alaska Treadwell Gold Mining Company.

CERTIFIED COPY OF RESOLUTION PASSED BY THE BOARD OF DIRECTORS OF ALASKA MEXICAN GOLD MINING COMPANY.

“Resolved that the proposed lease dated October 14th, 1909, of certain real property particularly therein described and situate on and near Sheep Creek in the Harris Mining District, Alaska, made by and between Oxford Mining Company and Alaska Treadwell Gold Mining Company, Alaska

Mexican Gold Mining Company and Alaska United Gold Mining Company, be and the same is hereby approved and accepted, and the President and Secretary are hereby authorized and directed, in the name of the Company and of its act and deed and under its corporate seal, to execute and deliver said lease to Oxford Mining Company.”

CERTIFICATE OF SECRETARY.

I, F. A. Hammersmith, hereby certify that I am the Secretary of Alaska Mexican Gold Mining Company; that the foregoing Resolution is a full, true and correct copy of a Resolution duly passed and adopted by the Board of Directors of said Company at a meeting held on the 11th day of November, 1909, as the same is now recorded on the minutes of the meeting of the Board of Directors.

IN WITNESS WHEREOF I have hereunto set my hand as such Secretary and affixed the Corporate seal of said Company, this 11th day of November, 1909.

[Corporate Seal.]

(Signed) F. A. HAMMERSMITH,
Secretary of Alaska Mexican Gold Mining Company.

CERTIFIED COPY OF RESOLUTION PASSED BY THE BOARD OF DIRECTORS OF ALASKA UNITED GOLD MINING COM- PANY.

“Resolved that the proposed lease, dated October 14th, 1909, of [53] certain real property particularly therein described and situated on and near Sheep Creek in the Harris Mining District, Alaska,

made by and between Oxford Mining Company and Alaska Treadwell Gold Mining Company, Alaska Mexican Gold Mining Company and Alaska United Gold Mining Company, be and the same is hereby approved and accepted and the President and Secretary are hereby authorized and directed, in the name of the company and as its act and deed and under its corporate seal, to execute and deliver said lease to Oxford Mining Company.”

CERTIFICATE OF SECRETARY.

I, F. A. Hammersmith, hereby certify that I am the Secretary of Alaska United Gold Mining Company; that the foregoing Resolution is a full, true and correct copy of a Resolution duly passed and adopted by the Board of Directors of said Company at a meeting held on the 11th day of November, 1909, as the same is now recorded on the minutes of the meeting of said Board of Directors.

IN WITNESS WHEREOF I have hereunto set my hand as such Secretary and affixed the corporate seal of said Company, this 11th day of November, 1909.

[Corporate Seal]

(Signed) F. A. HAMMERSMITH,
Secretary of Alaska United Gold Mining Company.
Commonwealth of Massachusetts,
County of Suffolk,
City of Boston,—ss.

WHEREAS the International Trust Company, a corporation, has reserved unto itself for the benefit of itself and various persons therein interested a lien

upon the property described in the foregoing lease for the sum of \$36,376, to secure the costs, advances, and charges in connection with the foreclosure of certain trust deeds upon certain property in the District of Alaska, a part of which is described in the foregoing instrument.

NOW THEREFORE THIS INSTRUMENT WITNESSETH.

That in consideration of the covenants contained in the foregoing agreement said International Trust Company for the purpose of binding the interest so held upon said property by said lien, assents, agrees and ratifies the execution of the foregoing lease with the Alaska Treadwell Gold Mining Company, et al., Party of the Second part, and agrees to substitute said lien upon any contract or contracts which may be made pursuant to the options contained in the said lease, so that the terms and provisions of said contract may be carried out.

Executed in triplicate.

Signed this 14th day of October, 1909.

[Corporate Seal.]

INTERNATIONAL TRUST COMPANY.

By JNO. M. GRAHAM,

Pres.

HENRY L. JEWETT,

Sect.

Witness:

WALTER W. BLACK.

HAROLD LAWRENCE.

Commonwealth of Massachusetts,
County of Norfolk,
City of Boston,—ss.

Be it remembered that on the 14th day of October, 1909, before me, the undersigned Notary Public, in and for said county and State personally appeared John M. Graham and Henry L. Jewett, Secretary of the International Trust Company, a corporation organized under the laws of the State of Massachusetts, to me known to be the individuals described in and who executed the foregoing instrument, as such President and Secretary for and on behalf of said International Trust Company as Trustee for the mortgage bondholders [54] under said instrument described; the said Henry L. Jewett having affixed the seal of said corporation to said instrument and they severally acknowledged to me that he, John M. Graham as president, and he, the said Henry L. Jewett, as Secretary of said Corporation, executed the foregoing instrument for and on behalf of said corporation as the free and voluntary act and deed of said corporation as Trustees for the uses and purposes therein set forth.

Then the said Henry L. Jewett being by me first duly sworn on his oath states that he is the Secretary of said Corporation, is acquainted, is the custodian, and has in his possession the corporate seal of said corporation and that the seal hereinbefore affixed is the corporate seal of said corporation and was affixed by him as such Secretary by order of the Board of Directors of said Corporation.

IN WITNESS WHEREOF I have hereunto set my hand and official seal the day and year first above written.

[Notarial Seal]

(Signed) LLOYD A. FROST,
Notary Public.

My commission expires Dec. 5th, 1913.

Commonwealth of Massachusetts,
County of Suffolk,
City of Boston,—ss.

WHEREAS the International Trust Company a corporation has reserved a lien upon the property described in the foregoing lease together with other property.

Now for the purpose of, further securing said lien, the undersigned lessor in the foregoing instrument, by order of its Board of Directors, hereby assigns the rentals due or to become due under the foregoing lease to the International Trust Company to be applied, first upon the payment of interest of the \$15,000. item of compensation reserved in favor of said Trust Company at the rate of six per cent (6%) per annum—and second that the balance of said moneys be applied pro rata upon the other items described in said lien so reserved.

Dated this 14th day of October, 1909, at Boston, Mass.

(Signed) OXFORD MINING COMPANY.
By WALLACE HACKETT,
President.

Attest:

HENRY ENDICOTT,
Secretary. [55]

AND WHEREAS, thereafter on the 31st day of October, 1910, the water power plant provided for in the fourth paragraph of said agreement was duly erected and equipped prior to that time, and the party of the first part duly elected to take the current of electric power provided for in said indenture and agreement of October 14, 1909, which said election was agreed and consented to by the parties of the second part;

AND WHEREAS, thereafter in the month of January, 1911, a certain instrument purported to have been executed by Joseph T. Gilbert, party of the first part, and Alaska Perseverance Mining Company, a corporation, party of the second part, was spread on the records of the Juneau Mining District, and is in words and figures following, to-wit: [56]

THIS INDENTURE made this 3rd day of December, 1910, between Joseph T. Gilbert, of Gilbertsville, Otaega County, State of New York, party of the first part, and the Alaska Perseverance Mining Company, a corporation organized and existing under the laws of the State of New York, party of the second part;

WITNESSETH:

That the said party of the first part for and in consideration of One Dollar and other good and valuable consideration, the receipt whereof is hereby acknowledged, does by these presents grant; bargain; sell; remise, release, convey and confirm to the said party of the second part, his successors and assigns the property described in the following agreement.

THIS AGREEMENT made and entered into this seventeenth day of June, A. D. 1897, by and between

Joseph T. Gilbert, of the City of Milwaukee, State of Wisconsin, party of the one part, and the Nowell Gold Mining Company, a corporation organized under the laws of the State of Maine, and doing business in the District of Alaska, the party of the other part.

WITNESSETH:

That whereas the said Joseph T. Gilbert has sold by deed given June 16, 1897, to the said Nowell Gold Mining Company, a certain mill site, water rights, sawmill, and appliances, situate at Sheep Creek in the Harris Mining District, District of Alaska, for the sum of Twenty-five Thousand (\$25,000) dollars, and other good and valuable considerations hereinafter specifically set forth.

Now therefore, it is understood by and between the parties hereto that in case the said Joseph T. Gilbert, his heirs or assigns, should at any time desire to develop by tunnel, or otherwise, or to operate any of the property, formerly owned by the Juneau Mining and Manufacturing Company, that he and they shall have the right and preference to take and use any surplus water not required by the said Nowell Gold Mining Company for use in operating their own properties at Sheep Creek and in Silver Bow Basin in said District; that he or they may draw the surplus water from any point of flumes or pipe lines belonging to said Company, providing that it may be done without expense to the said Nowell Gold Mining Company, and that it shall not interfere with the operations of the properties, or the business of said Company; it is further understood and agreed that

the said Nowell Gold Mining Company shall have the right and privilege to sell or dispose of any power to other parties arising from said surplus water when the same shall not be needed or required by the said Joseph T. Gilbert, his heirs or assigns, in operating any plant that may be erected by him, his heirs or assigns, in working or developing his properties acquired from the Juneau Mining and Manufacturing Company. It is further hereby stipulated and agreed by and between the parties hereto, that in case of sale by the Nowell Gold Mining Company, of its mines, mills, millsites, and water rights, or any part of same, situated at Sheep Creek and in Silver Bow Basin, in the District aforesaid, to any person, persons or corporations, that the said Nowell Gold Mining Company shall not have the right to dispose the said water right hereby acquired from the said Joseph T. Gilbert, to any person, persons or corporations, other than for the purpose of operating the property held and owned by the said Nowell Gold Mining Company at Sheep Creek in the District aforesaid, at the time of said sale, provided that said Joseph T. Gilbert shall require the use [57] of said water or the power generated thereby.

It is further understood and agreed by the parties hereto that the said Joseph T. Gilbert, his heirs or assigns shall be entitled to use for millsite or power purposes a frontage of not more than four hundred (400) feet commencing at post Number two (2) of that certain piece or parcel of land formerly held and owned by one Kittie Richardson, adjoining the Jumbo Mill-site and extending thence along the beach

in a southeasterly direction four hundred feet and extending back from the beach three hundred thirty-one and four tenths ($331\frac{4}{10}$) feet.

It is further understood and agreed by and between the parties hereto that the said Joseph T. Gilbert, his heirs or assigns shall have a right of way over and upon the land of said Nowell Gold Mining Company situate in the vicinity of Sheep Creek, District of Alaska, and that the said Nowell Gold Mining Company shall have a right of way over and upon the premises comprising four hundred (400) feet in length by three hundred thirty-one and four tenths ($331\frac{4}{10}$) feet reserved by the said Joseph T. Gilbert as herein set forth.

It is further understood and agreed by and between the parties hereto that the said Joseph T. Gilbert shall have the use and benefit as well as the possession of that certain saw mill known as the Sheep Creek saw mill and situate near the mouth of Sheep Creek up to and until January 1, 1900, and that he shall have for the purpose of operating and running said mill all the water necessary from said Sheep Creek flume and pipe line to operate said mill; or in the event of electric power to replace said water, then the said Nowell Gold Mining Company shall furnish, free of cost to the said Joseph T. Gilbert, all the power necessary to operate the said mill.

It is further understood and agreed by and between the parties hereto that that certain building and machinery thereto used as a dry house, situate near the saw mill, is the property of William T. Iliff, and is no way effected by the sale from the said Gilbert

to the said Nowell Gold Mining Company. It is further understood and agreed by and between the parties hereto that in case the said saw mill shall be destroyed by fire that neither party shall be held responsible, one to the other. It is mutually understood and agreed by and between the parties that the water and ground privileges in favor of the said Joseph T. Gilbert are an essential and integral part of this contract and that the Nowell Gold Mining Company obligates itself and assigns to aid and assist without expense to itself in every way possible the said Joseph T. Gilbert to the use of such privileges.

IN WITNESS WHEREOF the said Joseph T. Gilbert has hereunto set his hand and seal this twenty-third day of June, A. D. 1897 and the said Nowell Gold Mining Company by its president and by authority of the Board of Directors of said Company has set the seal of its President this 17th day of June, A. D. 1897.

JOSEPH T. GILBERT.

NOWELL GOLD MINING COMPANY.

By THOMAS S. NOWELL,

Its Pres.

In presence of:

J. J. MALONY.

JOHN R. WINN.

M. H. LATIMER.

E. F. CASSEL.

The above agreement is endorsed as follows:

District of Alaska,
Juneau,—ss.

The within instrument was filed for record at 2:30 o'clock P. M. June 27th, 1899, and duly recorded in Book 15 Deeds, etc., [58] on page 472 of the records of this district.

(Sgn) NORMAN E. MALCOLM,
District Recorder.

For a full and accurate description of the property conveyed by the said party of the first part to the said party of the second part, the above agreement made between Joseph T. Gilbert and the Nowell Gold Mining Company is here quoted for the purpose of fully describing the property conveyed in this agreement made between the party of the first part and the party of the second part.

IN WITNESS WHEREOF, the party of the first part has hereunto set his hand and seal this 3rd day of December, 1910.

JOSEPH T. GILBERT.

Signed, sealed and delivered in presence of
F. H. DONALDSON.

Now therefore pursuant to the agreement of the parties hereto of October 31, 1910, and the election of the party of the first part to take the electric current provided for in the agreement of October 14, 1909, formal conveyance of the said property has been made by the Oxford Mining Company to the parties of the second part;

NOW, THEREFORE, in consideration of the premises, it is hereby agreed that if the parties of the second part hereto are deprived at any time by

Alaska Perseverance Mining Company Joseph T. Gilbert his or their successors or assigns, of any of the water now appropriated and used by the second parties out of Sheep Creek at their power plant, then the party of the first part shall only be entitled to the three hundred (300) horse power of electric current provided in the agreement dated October 14th, 1909, decreased by the number of horse power that could be generated by the second parties at their plant with the water of which the second parties at their plant, with the water of which the second parties may have been deprived by Alaska Perseverance Mining Company, Joseph T. Gilbert, his or their successors or assigns.

IN WITNESS WHEREOF, the party of the first part has hereunto set its hand and seal the day and year first above written.

OXFORD MINING COMPANY.

By WALLACE HACKETT,

President.

HENRY ENDICOTT,

Treasurer.

Signed, sealed and delivered in the presence of

LEWIS P. SHACKLEFORD.

L. W. LATTEMORE.

In connection with the above contract the defendants aver that the rights, if any exist, of the above named Joseph T. Gilbert and his assigns under the above referred to contract of June 17, 1897, made with the Nowell Gold Mining Company, have never been adjudicated, determined or agreed upon. [59]

IV.

That under and pursuant to the agreements, contracts and arrangements above set forth, the defendant corporations did construct at Sheep Creek an electric power plant with an electric capacity of approximately 3,000 horse-power, which said power plant was by them completed within the time agreed upon and in the manner agreed upon in full compliance with the contracts and agreements above set forth.

V.

That from and after the date of the completion of said power plant as above stated the defendant corporations were at all times ready and willing to deliver to the said Oxford Mining Company or its successors the 300 electric horse-power referred to in the contracts and agreements above set forth.

VI.

That at or about the time referred to in the complaint a demand was made upon the defendant corporations to furnish the 300 electric horse-power as contracted for to the plaintiff corporation at which time notice was also given the defendant companies that the rights of the Oxford Mining Company in that behalf had been assigned to the plaintiff company; that immediately upon demand having been made in that behalf steps were taken to connect the transmission line of the plaintiff company with the power plant of the defendant companies in such a manner as to deliver to the plaintiff company the 300 electric horse-power referred to in the contract, and from and after that date an electric current of suffi-

cient volume and voltage to produce 300 electric horse-power was by the defendant companies furnished to and placed at the disposal of the plaintiff corporation at the power plant of the defendant companies at Sheep Creek. [60]

VII.

That the defendant corporations are the owners and operators of large producing mines situated on Douglas Island, in the Territory of Alaska, that is to say, the said three corporations are the owners and operators of what is usually known as the Treadwell Group of Mines, in connection with which approximately 900 stamps, as well as a cyanide plant are operated. That the power generated at the defendants' Sheep Creek Power Plant above referred to is used by them in connection with the operation of the said mines, stamp-mills and cyanide plant.

VIII.

That neither the defendant corporations nor any of them are engaged in the business of selling or disposing of power, and are not now and never have disposed of any power to any person, persons or corporations whatever, except a small quantity of power they are under contract to furnish to the Alaska Juneau Gold Mining Company; that they have not now and at no time hereinafter mentioned had any surplus power whatsoever not used by them in connection with their own operations after furnishing the power that they have long since furnished the Alaska Juneau Gold Mining Company; and that the operations of the defendant corporations require the continuous use of all the power available after so

furnishing the Alaska Juneau Gold Mining Company and the plaintiff respectively with the power to each as above stated.

IX.

That the defendant corporations have installed at their Sheep Creek power-house a circuit-breaker which automatically breaks the circuit whenever the plaintiff company draws from its bus-bars electric power equivalent to more than 300 horse-power; that the [61] circuit is not broken by said circuit-breaker unless more than 300 horse-power is so drawn; that the circuit-breaker as installed and maintained by the defendant companies is an appliance in common use in connection with the distribution of electric current and is the only appliance that can be installed or maintained by the defendant companies to protect themselves against short circuits occurring along the line of the plaintiff, and against attempts on the part of the plaintiff to draw from the bus-bars of the defendant companies horse-power in excess of 300 electric horse-power, and that unless the defendant companies are so protected against such short circuits and against such attempts to draw from their bus-bars a load in excess of 300 horse-power their plant is apt at any moment when such short circuits or peaks produced by such attempts to overload go in to be shut down, which shut-downs in addition to the damage naturally resulting in ordinary cases would in the case of the cyanide plant more especially result in great and irreparable damage due to the loss of gold-bearing solution in circuit and to the filling up of air lift pits which take from one to three days

to open up and again start in operation, and various other effects naturally resulting to a cyanide plant from a sudden shut down; in addition to the effect of a shut down the defendant companies the effect of short circuits and peaks coming in from the plaintiff's line would be to injure and disable and in many cases to destroy the generator, motors and other appliances and machines of the defendant corporations.

X.

That the circuit-breaker so installed and maintained by the defendant companies is so placed and at all times has been so placed as to permit the uninterrupted flow of a current of electricity of sufficient amperage and voltage to furnish [62] the 300 horse-power, and that if the plaintiff was at the times in the complaint mentioned or at any other time unable to utilize the 300 horse-power so made available for its use such inability of the plaintiff to utilize the same was due wholly to the inefficiency of its machines, the incapacity of those operating the same or to some other fault or faults of the plaintiff beyond the control of the defendant companies.

XI.

That while the capacity of the generators installed by the defendant companies at their Sheep Creek power plant is approximately 3,000 horse-power the flow of the water in Sheep Creek varies, so that at times there is ample water to propel said generators to their full capacity, while at other times there is no water at all. At the present time there is enough water to generate approximately 500 horse-power, that is to say, 200 horse-power in excess of the 300

horse-power furnished the plaintiff company, and as the season advances the flow of water will diminish, unless unusual weather conditions should prevail, until the spring thaw, and the rain that usually occur in the spring again swell the volume of water in Sheep Creek.

XII.

That in addition to the power plant at Sheep Creek the defendant companies have a power plant at Nugget Creek, for the generation of electric power, but that during many months in the year the combined power generated at Nugget Creek and Sheep Creek is insufficient to furnish power to propel the machinery of the defendant companies and the defendants are obliged to generate additional electric power by means of steam, and that at the present time they are using steam for that purpose, so that if the plaintiff corporation were to draw peaks from the defendants' general supply of electricity at the present time, the defendant [63] companies would be obliged to generate such excess amount of electric current by means of steam and would be obliged not only to use fuel, the cost of which is very large, but would also be obliged to maintain adequate machinery for that purpose.

XIII.

That the defendant corporations have at all times since the completion of their said Sheep Creek power plant stood ready and willing to deliver to the Oxford Company and its successors an uninterrupted and continuous flow of electrical current equivalent in amperage and voltage to 300 electric horse-power in

full compliance with the terms of the contracts above set out, and are now ready and willing to deliver the same, the same having been made available for the plaintiff's use in the manner above stated, and further, that the defendant corporations have in all respects complied with the covenants and agreements to be kept and performed by them or on their part in the above described contracts.

XIV.

That while the defendant companies were notified by the plaintiff company that it had succeeded to the rights of the Oxford Company to the 300 horse-power referred to in the above named contracts, the defendants are informed and believe and therefore allege the fact to be that the last above mentioned contract, being the agreement under date of April 22, 1911, which said agreement is the agreement by which the rights between the Oxford Company and the defendant companies were finally determined and agreed upon in relation to the 300 horse-power was never assigned to the plaintiff corporation, and that the rights arising thereunder in favor of the Oxford Company are still in said company and not in the plaintiff.

XV.

That by reason of the facts set up in the next preceding paragraph the plaintiff is not now and never has been entitled to receive from the defendant corporations, or either or any of [64] them, the 300 electric horse-power above referred to or any part of the same or any power at all.

XVI.

That a court of equity has no jurisdiction in the

premises to decree specific performance of the contract or contracts above set forth, or to any or either of them, or otherwise to enforce the provisions of the same or the provisions of any or either of them; that the defendant corporations and each of them are solvent and able to respond in damages to any judgment that might be recovered by the plaintiff against them or either of them for damages resulting from a breach of the above and foregoing contract or contracts, or either or any of them if such breach should occur, and that the plaintiff has a plain, speedy and adequate remedy at law and a court of equity has no jurisdiction to grant the relief prayed for in the complaint or any part thereof, the plaintiff's remedy being at law.

WHEREFORE the defendants, and each of them, pray that the plaintiff's bill of complaint be dismissed; that it take nothing by reason thereof and that the defendants and each of them recover their costs and disbursements in this behalf incurred.

HELLENTHAL & HELLENTHAL,
Attorneys for Defendants, Alaska Treadwell Gold Mining Company, Alaska United Gold Mining Company, Alaska Mexican Gold Mining Company and Robert A. Kinzie.

United States of America,
Territory of Alaska.

Robert A. Kinzie, being first duly sworn, on oath deposes and says: That he is the general superintendent of each and all of the above-named companies and corporations; that he has read the foregoing instrument and knows the contents thereof

and knows the same to be true.

ROBT. A. KINZIE.

Subscribed and sworn to before me this 7th day
of January, A. D. 1913.

SIMON HELLENTHAL,
Notary Public in and for the Territory of Alaska.
[65]

[Endorsed]: Original. No. 968-A. In the Dis-
trict Court for the District of Alaska, Division No.
1. Alaska Gastineau Mining Company, a Corpora-
tion, Plaintiff, vs. Alaska Treadwell Gold Mining
Company et al., Defendant. Answer. Hellenthal
& Hellenthal, Attorneys for Defendants. Office,
Juneau, Alaska.

Received a copy of the within Answer this 6th
of January, 1913.

SHACKLEFORD & BAYLESS,
Z. R. CHENEY,

Attys. for Ptffs.

Filed Jan. 7, 1913. E. W. Pettit, Clerk. [66]

*In the District Court for the District of Alaska,
Division No. 1, at Juneau.*

Case No. 968-A.

ALASKA GASTINEAU MINING COMPANY,
Plaintiff,

vs.

ALASKA TREADWELL GOLD MINING COM-
PANY, a Corporation, ALASKA UNITED

GOLD MINING COMPANY, a Corporation,
ALASKA MEXICAN GOLD MINING COM-
PANY, a Corporation, and R. A. KINZIE,
Defendants.

Reply.

Referring to the allegations contained in that portion of the defendants' answer on file herein subsequent to paragraph XII, being the affirmative allegations of the said answer, the plaintiff denies each and every allegation therein contained save and except such allegations as correspond with the allegations in the plaintiff's complaint.

SHACKLEFORD & BAYLESS,
Z. R. CHENEY,

Attorneys for Plaintiff.

United States of America,
District of Alaska,—ss.

B. L. Thane, being first duly sworn, on oath deposes and says: That he is the General Manager of the plaintiff corporation in the above-entitled action; that he has read the foregoing reply, knows the contents thereof and the same is true as he verily believes.

B. L. THANE.

Subscribed and sworn to before me this 15th day of January, 1913.

W. S. BAYLESS,
Notary Public for Alaska.

[Endorsed]: Due service of a copy of the within is admitted this 15th day of Jan. 1913. Hellenthal & Hellenthal, Attorneys for Defendants. Filed Jan.

15, 1913. E. W. Pettit, Clerk. Original. No. 968-A. In the District Court for the District of Alaska, Division No. 1 at Juneau. Alaska Gastineau Mining Company, a Corporation, Plaintiff, vs. Alaska Treadwell Gold Mining Company et al., Defendants. Reply. Shackelford & Bayless, Attorneys for Plaintiff. Office, Juneau, Alaska. [67]

*In the District Court for the Territory of Alaska,
Division No. 1, at Juneau.*

No. 968-A.

ALASKA GASTINEAU MINING COMPANY, a
Corporation,

Plaintiff,

vs.

ALASKA TREADWELL GOLD MINING COM-
PANY, a Corporation, ALASKA UNITED
GOLD MINING COMPANY, a Corporation,
ALASKA MEXICAN GOLD MINING COM-
PANY, a Corporation, and ROBERT A.
KINZIE,

Defendants.

Bill of Exceptions.

BE IT REMEMBERED that on the 7th day of January, 1913, the above-entitled and numbered cause came on regularly for trial before the Honorable PETER D. OVERFIELD, Judge of the District Court for the District of Alaska, Division Number One; that at such hearing the plaintiff appeared by its attorneys, Messrs. Shackelford & Bayless, and

the defendants appeared by their attorneys, Messrs. Hellenthal & Hellenthal, and that thereupon the following proceedings were had:

The plaintiff to maintain the issues on its part produced and called as witnesses the following named persons, to wit: L. P. Shackleford, B. L. Thane, W. S. Pullen, H. L. Wollenberg and H. A. Bishop.

And the defendants to maintain the issues on their part called as witnesses the following named persons, to wit: D. W. Proebstel, E. P. Kennedy, R. A. Kinzie and E. J. Kingsburg.

The witnesses so called by the respective parties, plaintiff and defendants, having been first duly sworn on oath to tell [68] the truth, the whole truth and nothing but the truth, testified on oath respectively as hereinafter set forth: [69]

[Testimony.]

[Testimony of L. P. Shackleford, for Plaintiff.]

L. P. SHACKLEFORD, being called and duly sworn, testified as follows on behalf of plaintiff.

Direct Examination.

Q. (By Mr. BAYLESS.) Just state your name.

A. L. P. Shackleford; attorney at law; Juneau, Alaska.

Q. Mr. Shackleford, prior to the month of August, 1909, were you the attorney for the International Trust Company of Boston?

A. Yes; I represented the International Trust Company since the month of December, 1905.

Q. Well, you had charge on behalf of the Inter-

(Testimony of L. P. Shackleford.)

national Trust Company of the negotiations with the Treadwell Company in this matter?

A. I had been representing them and had physical charge of their property—the property described in the lease of October, 1909.

Q. Well, just state—

A. In the month of May, 1908, I became attorney for the defendant companies in this case and became acquainted with Mr. Bradley and Mr. Taylor.

Q. At that time did the—what property did the International Trust Company own at Sheep Creek?

A. The International Trust Company was in possession and control of the property described in the agreement and lease set forth in the plaintiff's complaint in this case and was also in possession and control of what is known as the Silver Bow Basin placer mine.

Objection.

Q. What water right at Sheep Creek did the International Trust Company own?

A. In possession and control of a water-power plant about the same [70*—1†] place where this water-power plant is now situated of the defendant companies. It had a head of about 240 feet, as I remember, and a large pipe-line to it and had been actually in mining operation of the Sheep Creek mine.

Q. With railway and tram road and compressor and other buildings and appurtenances to it?

*Page-number appearing at foot of page of certified Transcript of Record.

†Original page-number appearing at foot of page of Testimony as same appears in Certified Transcript of Record.

(Testimony of L. P. Shackelford.)

A. There were a number—

Mr. J. HELLENTHAL.—Just a moment. I am inclined to think, your Honor, that all this matter having been merged into the contract is all immaterial anyway. Doesn't make any difference whether they owned this property or what happened to it. The contract is with reference to that property and we are—

COURT.—The Court will probably, before we get through with this case, want to know the situation of the parties at the time they entered into the contract.

Mr. J. HELLENTHAL.—Very well.

Q. (By Mr. BAYLESS.) Well, what negotiations did you have with Mr. Bradley about that time? A. Well, in the early part of August—

Mr. J. HELLENTHAL.—At this point, your Honor, we desire to interpose the objection that whatever negotiations were had—I don't object to Mr. Shackelford's stating that they had negotiations but as to just what the negotiations were between them is wholly incompetent and irrelevant because they were all subsequently merged into a written contract and the written contract is now all that can be before the Court.

COURT.—The same ruling. The Court has already ruled and rules again the same way; that is I presume, as I say it necessary in the hearing of this cause to know the exact situation of the parties at the time they entered into the contract; not to vary the terms of the contract that they are [71—2]

(Testimony of L. P. Shackelford.)

claiming, of course, but to be able to understand the intention of the parties.

Mr. J. HELLENTHAL.—No objection, your Honor, to the testimony so far as it bears on the situation of the parties. The only objection is to the testimony so far as it bears on the actual agreement between the parties because that is merged in the contract.

COURT.—My ruling will go a little further than that, Mr. Hellenthal, to save your record. What the intent was under the contract will probably be facts important for me to understand as any other part of the negotiations or surrounding circumstances at the time the contract was entered into and before I can know.

Mr. J. HELLENTHAL.—May it be understood, your Honor, that all the testimony bearing on that matter goes in under my objection as incompetent, irrelevant and immaterial.

COURT.—Exception will be allowed.

Mr. J. HELLENTHAL.—That the matter is all merged in the written contract, and exception allowed.

COURT.—The record may so show. You may proceed.

A. (By the WITNESS.) In the early part of August, 1909, Mr. Bradley came to my office and stated that they would like to acquire what is known as the lower water right and power plant and mill-sites on Sheep Creek. That plant was in a state where it could be used, but it hadn't been in use for

(Testimony of L. P. Shackelford.)

two or three years, the title to the Sheep Creek mines having been in dispute and after some discussion I informed him that I didn't think he was prepared, from his offers, to pay a price that would be attractive to the owners of the property and he finally outlined an agreement which he called a—I have forgotten the exact term. It is a—

Q. (By Mr. BAYLESS.) Flood water contract?
[72—3]

A. —flood water agreement, and it was practically in the form that it is now.

Q. (By the COURT.) At what time was that?

A. That was in the month of August, 1909. So within two or three days, some time prior to the 10th of August, his representations at that time was that he was willing to insure to the International Trust Company and the parties interested in that property or in the Sheep Creek mines sufficient power to operate the Sheep Creek mines, and I told him that I thought a contract along that line giving adequate power for the operation of the mine might meet with the approval of the Boston bondholders and of the trust company. He estimated that we would need at least 150 horse-power to operate the mines with; that was not to start the machinery but to operate the mines with, and he said that he thought 200 horse-power would be a liberal estimate for the power continuously required in the operation of the mine. The contract was a draft of our ideas about the matter.

Mr. J. HELLENTHAL.—It is understood the record covers my objections to the questions?

(Testimony of L. P. Shackelford.)

The COURT.—It is so understood. The record will so show.

A. (By the WITNESS.) A draft of our ideas about the matter so far as we had gotten, involving a lease during the period of the construction and an option to take the horse-power and an option in the case we didn't at the end of ten years take the horse-power, was drawn up and various alterations in it were made.

Q. (By the COURT.) Who drew up the option?

A. I drew a skeleton of the option and after that time the option was either drawn or dictated by Mr. Bradley or Mr. Taylor. [73—4] The option probably will be—the original draft is probably in my handwriting very largely, as both the gentlemen suggested alterations and changes I would note them. The option or the contract, I should say, wasn't signed by either of the parties at that time. It was simply a draft for submission in Boston.

Q. Drawn up where originally?

A. Drawn up here in Juneau and at Treadwell—after it was completed, I will say that the last clause in the option defining an uninterrupted current was drawn by me. I originally used the word “continuous” instead of “uninterrupted” and it stood in the contract, I think, until we got on a boat. We went down below together. At that time it was changed to the word “uninterrupted” at Mr. Taylor's suggestion because he said continuous had a meaning in electricity which might require them to deliver a direct—at any rate that word was changed.

(Testimony of L. P. Shackelford.)

However, when the contract was completed, Mr. Bradley wrote a letter to Mr. Henry Endicott, who was the most influential bondholder in the—under the mortgage deed of trust, held by the International Trust Company and who represented most of the other bondholders and I took that letter with me and a draft of the contract. The original of that letter is in Boston. I have a copy, however, which I have examined and which I know to be a correct copy and I will present the letter in connection with my testimony.

Q. (By Mr. J. HELLENTHAL.) Do you wish to offer this, Mr. Shackelford? A. Yes.

Mr. J. HELLENTHAL.—I would suggest, your Honor, that the making of the offer or receiving of this letter be delayed [74—5] until I can inquire into the correctness of the copy. I presume it is a correct copy; don't desire to put Mr. Shackelford to the trouble of getting the original unless it is necessary.

COURT.—May proceed.

A. (By the WITNESS.) Upon my arrival in Boston I presented to them the draft of the contract and the matter was discussed between the three principal bondholders and myself, Mr. Henry Endicott, Mr. William Endicott and Mr. Wallace Hackett,—and they asked me if I considered 200 horse-power adequate and I told them that was a subject upon which I declined to advise them because I had no technical knowledge of the requirements of the plant. I could tell them there was a

(Testimony of L. P. Shackleford.)

thirty-stamp mill there and about the machinery that was there. At that time Mr. Thane was in Boston and they took the matter up with him and asked him.

Mr. J. HELLENTHAL.—This, your Honor, is quite a long ways from any agreement. That was had between the Endicotts and officers of the people themselves.

COURT.—Yes; I think it is. I agree with you.

Mr. J. HELLENTHAL.—If the matter is only a matter relating to things that lead up to something, why of course it is all right.

COURT.—Of course, statements between yourselves with the International Trust Company that the defendants had no notice of, no knowledge and no one present, of course wouldn't in any way be binding until I see how it might assist the Court in this case. Any knowledge on the part of one contractor that wasn't conveyed in any shape or manner to the other wouldn't be.

Mr. BAYLESS.—If the Court please, all this leads up to the addition of 300 horse-power in place of the 200 horse-power as the contract was subsequently drawn.

COURT.—If that was, of course, made known to the other parties—the Treadwell Company—then it would be all [75—6] right. No objection to it.

Q. (By Mr. BAYLESS.) I will ask you, Mr. Shackleford, if the conversation in Boston and negotiations there—you had with the Endicotts and Wallace Hackett was afterwards made known to the

(Testimony of L. P. Shackelford.)

Treadwell company?

A. I don't think the details of them were. The result of Mr. Thane's advice was made known to Bradley.

Q. (By the COURT.) Made known to Treadwell? A. To Mr. Bradley.

COURT.—Well, it is difficult for me to rule on such kind of statement.

Mr. J. HELLENTHAL.—Let it go in under my objections and exception.

COURT.—Very well.

Mr. J. HELLENTHAL.—With the understanding, we may latter move to strike it.

COURT.—Very well.

A. (By the WITNESS.) All I may say on the subject is simply this, that after consulting with Mr. Thane he advised them that they would require 300 horse-power in continuous use to operate that mine. Thereupon Mr. Henry Endicott sent a wire to Mr. Bradley at Wardner, Idaho, a copy of which I present for identification and ask to be offered.

Q. (By the COURT.) You were present at the time that Thane discussed this matter with Endicott and Hackett? A. Yes, sir.

COURT.—Just read that last part of it.

Mr. J. HELLENTHAL.—That is a copy of the original, you say?

A. Yes, that is a copy of the telegram.

Mr. J. HELLENTHAL.—Let that also be held, your Honor, until [76—7] it can be compared. I think it is probably all right.

Mr. BAYLESS.—We ask to have them identified, both these papers.

COURT.—May be marked for identification.

[Plaintiff's Exhibit No. 1 for Identification.]

“A. G. Co. v. Al. T. Co., et al., Plff's. Ex. 1 for Ident. R. E. R. Rec'd. R. E. R.

(Copy)

Treadwell, Alaska, August 10, 1909.

Henry Endicott, Esq.,
101 Tremont Street,
Boston, Mass.

Dear Sir:

We have been talking to Mr. L. P. Shackleford about your water right on sheep creek this district and both he and ourselves have agreed upon what we consider an extremely fair proposition our concession have been drawn up in the shape of a document which Mr. Shackleford will present to you as it is now this sheep creek water power is in jeopardy and can be taken at any time by adverse interests our proposed arrangement will preserve your rights while at the same time developing them and making the most use of them. I presume you are holding this water right for the value that it has had and may have in the future for working the sheep creek mines and thirty stamp mill connected therewith estimating conservatively 150 HP. is all the power these mines and mills ever required for their past operations. The mill is amply large enough for the mine and surely two hundred H.P. will more than take care of future requirements if the proposition is at all acceptable to you we would begin immediate

(Testimony of L. P. Shackleford:)

work thereby preserving your rights and returning you some monthly income the proposition provides amply time in which you could decide [77—8] either to sell the property outright or take two hundred H. P. for the operation of the mines and mill, your very truly,

F. W. BRADLEY.”

[Plaintiff’s Exhibit No. 2 for Identification.]

“A. G. Co. v. A. T. Co., et al. Plff’s Ex. 2 for Ident. R. E. R. Recd. R. E. R.

(Copy)

Boston, August 23, 1909.

F. W. Bradley,

Wardner, Idaho.

Will lease power on terms proposed subject to consent trust company if three hundred horse power is substituted for two hundred.

HENRY ENDICOTT.”

COURT.—Go ahead.

A. (By the WITNESS.) Two or three days afterwards—the exact date I haven’t and the exact date of Mr. Bradley’s telegram I haven’t but I have a copy of—of both of the telegrams—Mr. Endicott received the following telegram from Mr. Bradley.

Mr. J. HELLENTHAL.—Let that be held in the same way, your Honor. I think probably that is a copy of the telegram.

COURT.—It may be marked for identification Plaintiff’s Exhibit 3.

(Testimony of L. P. Shackelford.)

[Plaintiff's Exhibit No. 3 for Identification.]

“A. G. Co. vs. A. T. Co. et al. Plff's Ex. 3 for Ident. R. E. R. Recd. R. E. R.

(Copy)

Henry Endicott:

You may substitute three hundred for two hundred horse power may I cable Sup't Kinzie to begin immediate protection measure.

F. W. BRADLEY.” [78—9]

A. (By the WITNESS.) Thereupon there was no—there was nothing done for several days until Mr. Bradley's wire was received. Shortly after that Mr. Hackett and I proceeded with the organization of the Oxford Mining Company and the property theretofore held in trust by the International Trust Company was deeded to the Oxford Mining Company as soon as the president of the Trust Company returned from Europe and as soon as this was done the contract, as drafted or submitted by Mr. Bradley with his letter in August, was signed exactly as drafted and submitted except wherever the words two hundred horse-power had appeared in the contract originally the words three hundred horse-power were substituted.

Q. (By Mr. BAYLESS.) During all these negotiations was anything said by either of the parties with reference to a starting surge?

A. No; nothing was said at all. I had no knowledge whatever of the necessity of a starting surge. I didn't suggest it; didn't discuss it. The estimates that were made of the amount of power that we would

(Testimony of L. P. Shackleford.)

require by Mr. Bradley at the time the contract was drawn was based on the actual need of the mine and not upon any starting surge, as discussed here, and it wasn't until after October, 1910—after we had elected to take the current that any statement was made to me or anybody with my knowledge concerning the fact that the starting surge was necessary or that the contract meant anything else in practical and effectual terms than three hundred horse-power.

Q. Nothing was said about a peak load?

A. Nothing was said about a peak load by any of the parties until after we had elected to take the current. [79—10]

Q. And Mr. Bradley and Mr. Taylor practically drafted the contract as afterwards signed?

A. It was drafted as their proposition. They didn't sign it—they drafted it and then enclosed it in this letter from Mr. Bradley which has been presented. As soon as the Oxford Company signed the contract it was sent to San Francisco and signed there.

Q. And the only change that the Oxford Company put into Mr. Bradley's contract was three hundred horse-power where Mr. Bradley had two hundred?

A. That is it.

Q. And it was the representations of Mr. Bradley upon which the Oxford Company, Wallace Hackett and the Endicotts relied?

A. Yes, this correspondence was presented to them and from the discussions had at the time I know that they assumed that they would have an effectual

(Testimony of L. P. Shackleford.)

power at their disposal of the amount named in the contract.

Mr. J. HELLENTHAL,—Your Honor, I think that is going pretty far—what it indicates and I think that is pretty far.

COURT.—Well, I presume it is a conclusion that we might say an attorney might draw for a company. It may stand for what it is worth.

Mr. BAYLESS.—I think that is all.

Cross-examination.

Q. (By Mr. J. HELLENTHAL.) When were these negotiations made, Mr. Shackleford?

A. In the early part of August.

Q. That is the year 1909? A. 1909.

Q. 1909. Yes. [80—11]

A. Mr. Bradley had negotiated once or twice before that time with other parties, I think, about purchasing power from Sheep Creek but the negotiations had never come to anything before this time. This was the first negotiation he had at—the year before he had said to me: “I would like to have the plant,” and then the matter was dropped without any further discussion.

Q. The discussion that Mr. Bradley had with you at the time was rather of an informal nature, was it not, Mr. Shackleford? You were representing Mr. Bradley as attorney and also the International Trust Company and had informal conversations with him before anything was done—that was in August?

A. Why, the talk wasn't informal. The first day he came over there and discussed the matter in-

(Testimony of L. P. Shackleford.)

formally. After that when we got down to drawing the contract and the requirements—the amount of power, the talk wasn't informal.

Q. The International Trust Company had a small generator on one of these millsites at that time, as I understand it?

A. I don't know the size of the generator, Mr. Hellenthal. I know it operated a compressor plant of considerable size and I know the mine had been operated, at least partially operated from that power plant—they had had two power plants. One had taken advantage of the upper falls, but it had been in disuse a number of years.

Q. It was the lower falls with which they were contracting?

A. Yes; the lower waterpower which was the subject of the contract.

Q. And the lower power plant was the one to which you referred to?

A. The lower power plant is the one described in the contract of October, 1909.

Q. That was situated approximately where the Treadwell Company's [81—12] new power plant is now situated? A. Yes; that is it.

Q. The first contract executed—after the first negotiations that were had between yourself, Mr. Bradley and the Boston parties the lease or contract of October 14th was executed, was it not, Mr. Shackleford?

A. Yes, sir; that was the first contract—October 14, 1909.

(Testimony of L. P. Shackelford.)

Q. That is the contract set up in the answer here?

A. Yes, sir.

Q. As the first contract executed?

A. That is right.

Q. After that the power plant was constructed. You turned the possession of all the property described in this lease over to the Treadwell Company as the agent?

A. They took possession of it in the month of September or August—I have forgotten—before the contract was actually executed, but upon advice that was agreeable to the owners.

Q. They took possession of the power plant and the millsites and other properties described in this lease and went at the construction of their plant?

A. Started in the construction of their plant.

Q. The plant was constructed that fall, was it. Mr. Shackelford?

A. No; the plant was constructed during the ensuing year.

Q. In part that fall and in part the next year?

A. Yes, sir.

Q. After the plant had been constructed your people elected to take the twenty-five—or the 300 horse-power provided in the lease in lieu of the twenty-five thousand dollars at a later date and then the final contract and agreement, including the deed to the property was executed? Is that true?

A. No; that is not exactly right.

Q. Well, how is that? [82—13]

A. The original contract of 1909 required that we

(Testimony of L. P. Shackelford.)

should exercise our option to take the power, if we exercised such an option, at the end of two years—

Q. Yes.

A. —but at the end of the first year the plant had been completed.

Q. Yes.

A. The time the contract was drawn, we didn't expect the plant to be completed that soon—so as soon as it was completed I was in San Francisco and an inquiry was made of me about whether we were going to take the power or not, and I gave them notice of election sometime in October, 1910.

Q. (By the COURT.) By "them," who do you mean?

A. They—the defendant companies in this case; the Treadwell and the Mexican and the United—notice of election—

Q. (By Mr. J. HELLENTHAL.) Yes.

A. —to take the power. The second instrument which you call a contract there is a deed. We simply deeded under the provisions of the contract of 1909.

Q. That second instrument—was it executed?

A. Yes, sir.

Q. That is the second instrument set up in the answer?

A. Yes. I think that instrument was executed the next spring but the election had been given—

Q. Executed whenever it is dated?

A. —in the fall.

Q. But at the time it is dated?

A. Yes, sir; about that time.

(Testimony of L. P. Shackelford.)

Q. Then after that, Mr. Shackelford, your attention and the attention of the defendant companies was directed to what was called [83—14] and generally referred to as the Gilbert contract? Do you recall that?

A. I returned here after having given notice of election to take the power—

Q. Yes.

A. —returned here in December; I think it was in 1910 and sometime in January my attention was called to an instrument which had been recorded up here called the Gilbert contract which was at that time some ten or twelve years old—

Q. Yes.

A. —and considerable discussion about it, and when I was in San Francisco in February, after corresponding with the members of the Oxford Company, I stated that the Oxford Company had no desire to claim under their present contract in the case Gilbert should ever establish his right to the water; that is, didn't want to claim any diminution that had been given in Gilbert's favor and against the defendant companies in this case, and, as a result of that, later in the year—I have forgotten the exact date—a contract in the form or with the intention rather of an indemnity contract was executed between the parties.

Q. That is the contract set up in the answer—the third contract set up in the answer?

A. Yes; that is the third contract.

Q. Under date—the 22d of April, 1911?

(Testimony of L. P. Shackelford.)

A. I don't remember the day,—

Q. About the date?

A. —but that is the third contract which you set up in your answer.

Q. That contract was then executed between the parties? [84—15]

A. Yes, sir.

Mr. J. HELLENTHAL.—That will be all, Mr. Shackelford.

Witness excused. [85—16]

[Testimony of B. L. Thane, for Plaintiff.]

B. L. THANE, being called and duly sworn, testified as follows on behalf of the plaintiff.

Direct Examination.

Q. (By Mr. SHACKLEFORD.) Mr. Thane, state your name, residence and occupation to the Reporter.

A. B. L. Thane; Juneau, Alaska; mining engineer; manager of the Alaska Gastineau Mining Company.

Q. You are the manager of the plaintiff corporation in this case? A. I am.

Q. I will ask you, Mr. Thane, if you were present in Boston in the summer or early fall of 1909?

A. I was.

Q. Do you recollect an incident of my presenting certain correspondence and a draft of an agreement for water-power at Sheep Creek at the office of Mr. Henry Endicott, 101 Vermont street? A. I do.

Q. I will ask you if your advice on the requirements in the way of horse-power was requested at that time with reference to the amount of horse-power that would be necessary to the operation at

(Testimony of B. L. Thane.)

Sheep Creek? A. It was.

Q. You were more or less familiar with the general equipment at Sheep Creek? A. I was.

Q. I will ask you if you advised them as to the amount of horse-power that would probably be required there for the operation of the mine. [86—17] A. I did.

Q. What amount does it—?

Mr. J. HELLENTHAL.—Now, we object to that, your Honor.

COURT.—That goes in under the same ruling the Court has made heretofore, with an exception.

Mr. J. HELLENTHAL.—Object, incompetent, irrelevant and immaterial.

A. (By the WITNESS.) May I answer the question?

COURT.—Answer the question.

A. I advised them 300 horse-power.

Q. (By Mr. SHACKLEFORD.) Was that advice based on any estimate whatever as to the necessity of starting surges? A. It was not.

Mr. J. HELLENTHAL.—Do I understand, your Honor, that Mr. Thane's answer to the last question is also subject to the same objection?

COURT.—Yes, all of this, Mr. Hellenthal.

Mr. J. HELLENTHAL.—All right.

COURT.—By all this, I mean all this class of testimony which you have already objected to and taken an exception to.

Mr. J. HELLENTHAL.—Yes, sir.

Q. (By Mr. SHACKLEFORD.) Mr. Thane,

(Testimony of B. L. Thane.)

what time did the plaintiff company in this case take possession of the property of the Oxford Company—during about what time? A. Sometime in May.

Mr. J. HELLENTHAL.—I think that is immaterial.

A. (By the WITNESS.) May of this year.

Q. (By Mr. SHACKLEFORD.) I will ask you if you notified the defendant corporations early in the summer that you expected to use this power in winter operation? [87—18] A. I did.

Q. How soon was that, approximately—the first notice?

A. I think it was during the month of September.

Q. (By the COURT.) I don't understand—what year? A. September or October.

Q. (By Mr. SHACKLEFORD.) What year is this? A. Last year—1912.

Q. 1912? A. Yes.

COURT.—Do I understand from the attorney's remarks that there is no contention about the plaintiff company's being the successor in interest of the International and the Oxford?

Mr. J. HELLENTHAL.—No, your Honor, that is not the correct conclusion.

COURT.—You said it was immaterial. I didn't catch what you meant, unless you would mean that.

Mr. J. HELLENTHAL.—That may become material hereafter as to whether the plaintiff has succeeded to the rights. Mr. Thane's testimony only goes to the fact of having taken possession of some of

(Testimony of B. L. Thane.)

the Oxford properties and doesn't go to the extent of that.

Q. (By Mr. SHACKLEFORD.) As early as July of this year, Mr. Thane, you commenced preparations for construction of lines with which to take this power from the Sheep Creek plant? A. We did.

Q. (By the COURT.) That is you mean July of last year?

Q. (By Mr. SHACKLEFORD.) July of last year, 1912. I will ask you, Mr. Thane, to describe in a general way what was done with reference to making connections and your plans for the use of this power during the ensuing time? [88—19]

Mr. J. HELLENTHAL.—Now, your Honor, I think that is quite immaterial, except to use it, that is all.

COURT.—I didn't catch the last part of your statement.

Mr. J. HELLENTHAL.—If he states they got ready to use it that is as far as he should go into the matter, as it don't bear on anything—immaterial—merely encumbers the record I think, and not necessary.

COURT.—I don't on the surface see the materiality.

Mr. SHACKLEFORD.—Well, if your Honor please, we have a complaint here which alleges the situation of the parties in considerable detail with reference—with what power to connect and the proposed work of this company and if we didn't connect the power up and start in to work and rely on it and

(Testimony of B. L. Thane.)

had a program at work, and introduced such evidence as that we will find at the end of this case Mr. Hellenenthal will again insist on his demurrer on the ground that we are entitled to legal and not equitable relief.

COURT.—The point is well taken. May proceed.

A. (By the WITNESS.) The point is just this: after the consolidation was executed in New York and all the stock and bonds had been exchanged I was given orders by the people who had advanced the money and placed it in the treasury to start the work and in the meantime Mr. E. C. Jacklin and Mr. Albert Holden, two very well known mining engineers, arranged to come out in July to form a basis of the size of the equipment that we would put in,—be necessary to make the proposition pay and put it in shape. They arrived in July.

Mr. J. HELLENTHAL.—Mr. Thane, just a moment. If it please the Court, let it be understood that the testimony bearing on [89—20] this matter goes in under our objection as incompetent, irrelevant and immaterial; that the rights of the parties have to be determined by the contract itself.

COURT.—Objection overruled and exception allowed, which will go to this class of testimony as introduced in this case.

Mr. J. HELLENTHAL.—Yes, your Honor.

COURT.—Not only by this witness but any witnesses that may follow which will save you making objections and the Court ruling.

A. (By the WITNESS.) They arrived about the 4th or 5th of July and looked over the whole proposi-

(Testimony of B. L. Thane.)

tion and decided that it would require at least a 6,000 ton plant in order to make the proposition a payable one and to pay interest on the bonds and on the money necessary to put it in such shape. There was some three and a half million dollars of bonds of the old company outstanding, six per cent bonds, and after a great deal of discussion and a a great deal of engineering work, which had been prepared during the last two years, I was given orders by these gentlemen to push this work as hard as it could be done because every day meant money. Well, I got our organization together as rapidly as possible and started the work all along the line. One of the first efforts was to get connected with the Sheep Creek plant so I could make use of the 300 horse-power as soon as the water got short in Silver Bow Basin and likewise throughout the whole proposition have been working night and day to push it forward and I think it was in September I got into touch with Mr. Kinzie by letter or telephone regarding the use of this 300 horse-power and after considerable correspondence on the subject why they [90—21] finally let us use it and we started in to use it in Silver Bow Basin and also at Sheep Creek and used it up to the time of the fire, and after the fire we used it to Christmas, and after Christmas I was unable to start and everything was shut down in the mine, and I assure you we have made every effort possible there to carry on the line of development work which has been laid out. As a matter of fact all of our work has been laid to schedule—a time schedule—the de-

(Testimony of B. L. Thane.)

velopment of the mine must be done at a certain point—a certain period to try to be ready for the mill and we are working on that basis up there and have maintained and gotten together a crew for that purpose. We have started a great many different openings in the mine, raises, stopes and driving, and organized a crew and they were all working on a bonus in order to push it and the same thing is true at Sheep Creek and all along the line. We are supposed to have all this work done some time after January, 1914, but probably January 1, 1915, I should have said, and we are working as hard as we can to bring that about.

Q. (By Mr. SHACKLEFORD.) Now, Mr. Thane, just describe to the Court what you are opening up at present and how a delay in the power necessary in the opening up of your present workings will effect the final date of the starting of the mine and the effect of getting certain other work done that is under way.

A. Our Silver Bow Basin—we have already had a cross-cut in there, called the Alexander cross-cut, that is approximately 700 feet higher than the Sheep Creek level which will be the main artery through which the ore will go to the mill when they are built at Sheep Creek. Formerly the mines at the [91—22] Perseverance were worked by stopes which were opened up directly over the Alexander cross-cut through means of drifts which were driven east and west on the lode system. This cannot be continued on a large scale because the mine would be opened up

(Testimony of B. L. Thane.)

in the heart of the ore body and endanger it. As a result and in order to supply a large equipment we found it necessary from an ordinary mining standpoint to open up the mine from an entirely different view and that was from the top down. In order to do this we have to drive certain ore-vein-ways—ore-ways, raises, and the Alexander cross-cut up to the surface and expect to open a level 200 feet from the surface which will be our main working level which will be 4,500 feet long. Now, we have to connect that clear through to the Sheep Creek level, a distance of 2,300 feet by means of these two ore-ways, or in the familiar speech, vertical shafts to transport supplies and men. We are now in process of getting these main arteries up to the main working level above, so we can drift off this coming summer, by next year, and put in the chute-ways and open up the stopes necessary to deliver a tonnage of 6,000 tons per day. That is the present line of work.

Q. How many men have you got employed at the Perseverance mine on this development work?

A. Well, we have all that the boarding-house will hold at the present which runs from 175 to 225 daily.

Q. Approximately what is your daily expense there in pay-roll? A. About \$750.00.

Q. (By the COURT.) When you say Silver Bow Basin, do you mean the Perseverance mine—it is used interchangeably? [92—23]

A. Yes, the Perseverance mine is part of the consolidation which is up in Silver Bow Basin, extends clear through to Sheep Creek. The main artery

(Testimony of B. L. Thane.)

from Sheep Creek is going through to connect with the Perseverance on the main lode that is being driven at the present time and the plans of it we have for the mill are being made right now by men in the office—and clearing the foundation for it.

Q. (By Mr. SHACKLEFORD.) A delay at this time in that development work, Mr. Thane, what effect would it have in meeting the other work that is outlined and being carried on?

A. Well, it is a very serious thing. If we are unable to get these raises through this year we can't take advantage of the flow of waters which we have in Silver Bow Basin this coming summer; keep on the full capacity of our compressor plant, in opening up the stopes in the time left—we have got to get those raises through before the water begins to flow if any way to do it; otherwise won't get the mine opened up in time.

Q. Now, with reference to the labor situation: is there any difficulty occurred if you were to discharge a crew of men like this and get it together again? Just state that to the Court.

A. There is at least considerable difficulty attached in obtaining good shaft men and good raise men—plenty of ordinary miners that come and go, but a hard thing to get men who are capable of pushing shaft work and raise work, and we have gone as far as to send to Michigan in order to bring out some capable men for that purpose. Crews have been organized in the different shafts and raises which we are now driving. [93—24]

(Testimony of B. L. Thane.)

Q. What is the amount of bonds, Mr. Thane, now outstanding?

A. About three million and a half par value of Alaska Gastineau bonds outstanding.

Q. What is the rate of interest?

A. Six per cent.

Q. Any delay in reaching the productive stage of this mine would simply accumulate the interest on these bonds?

A. It does, besides that there is—you see the Alaska Gastineau Mining Company—the majority of bonds and shares are held by the—by what is known as the Alaska Gold Mines Company, being a holding company, and besides this three and a half million of bonds which is outstanding there has also already been issued a very large sum to the treasurer of the Alaska Gastineau Company and also a very large sum to the treasurer of the Alaska Gold Mines holding company to be used later in the purchase of this very large equipment and the expenditure of four millions and a half and the bigger part of it is already—

Q. I understand you that prior to the 8th of November the defendants in this case were notified of the assignment of the contract in question to the Gastineau Company?

A. To who—the plaintiff?

Q. The defendants were notified of the assignment of this contract? A. Yes.

Q. Between the Oxford and themselves, to the Gastineau Company? A. Yes.

(Testimony of B. L. Thane.)

Mr. J. HELLENTHAL.—That is not the best evidence, your Honor.

Q. (By Mr. SHACKLEFORD.) Well, I will ask you if you had any conference with their attorneys with reference to the matter. A. I did.

Q. What did that finally result in with reference to getting [94—25] the power?

A. They gave it to us.

Q. Now, what use did you put that power to when it was first given to you—did you have any difficulty in starting? A. No.

Q. How was that power used from that time until the time of the Silver Bow Basin fire, just in a general way?

A. Why, at first they gave us enough power to run both the Perseverance and the Sheep Creek plant; later on they must have changed their circuit-breaker and the amount of amperage which they were allowing us, so we were only able to run the Perseverance by itself.

Q. Just tell the Court what you have installed in the Perseverance mine upon which this current is being used?

A. We have a compressor, Ingersoll-Rand compressor of modern type, capable of compressing air to the amount of 325 cubic foot a minute with a—I think that is the exact amount—requires about 165 horse-power to run; we have a 200 horse-power type K motor to drive this compressor with.

Q. What make of motor is K? A. What make?

Q. Yes.

(Testimony of B. L. Thane.)

A. It is a General Electric type K, standard squirrel caged type motor.

Q. Now, I wish you would explain to the Court what the situation is with reference to the general use of K motors in mining operations at this time and at the time the contract was executed in 1909.

A. A K motor is a standard motor used generally all over the world; in fact a type of motor it is particularly built to hold any outside resistance and nobody can fool with it, [95—26] nobody can hurt it; anybody can work around it; and it will stand all sorts of rough usage and dust and dirt and run right along, and I believe it is, ordinarily speaking, it is the motor which is in most use.

Q. What else is that current at the Perseverance—what else is that applied to beside the running of this motor?

A. Well, there are a few lights, that is all.

Q. Mr. Thane, I will ask you about the use of—about the common, ordinary usage, accepted usage, with reference to the measurement of horse-power where power is called for in a contract.

Mr. J. HELLENTHAL.—Now, just a moment, your Honor, that is not a matter for expert testimony or any testimony; that is a question for the Court and in any event if that is a matter for testimony at all it is a matter for expert testimony and Mr. Thane hasn't been qualified to speak on that subject.

COURT.—The latter objection may be taken.

Q. (By Mr. SHACKLEFORD.) I will ask you,

(Testimony of B. L. Thane.)

Mr. Thane, what your experience is in the use of electrical machinery and what experience you have had in the investigation of these subjects with reference to qualifying you as a witness?

A. Well, I haven't been especially trained in electricity, that is. I haven't made a specialty of it. I have come in contact however with electrical equipment and general electrical information, not alone in my college training—university training as a mining engineer, but through the past twelve years in active service in the mining business, and I think I have what any—what knowledge any man would have under the same circumstances. There is nothing about the subject but what anybody can understand. You may have a specialist— [96—27] as a mining engineer you are constantly confronted with all sorts of problems connected with the subject even though you may have a specialist to do the detail work.

COURT.—The objection is now overruled. You may proceed.

Mr. J. HELLENTHAL.—Your Honor, I wish to renew my objection on the ground that the matter inquired about is not a subject of testimony at all, but is a matter for the Court.

COURT.—The objection will be overruled and exception allowed.

G. (By Mr. SHACKLEFORD.) Go ahead, Mr. Thane, and state what the ordinary usage is with reference to the measurement of horse-power per current called for in denomination of horse-power.

A. It is always measured by wattmeter; can't be

(Testimony of B. L. Thane.)

measured by anything else.

Q. I will ask you, Mr. Thane, if you know what the ordinary type of circuit-breaker is that is used where power is sent out from a power-house?

A. The ordinary type is what is known as a time relay circuit-breaker.

Q. What is that usually set at, Mr. Thane? Just explain to the Court the meaning of that.

A. Well, the time relay circuit-breaker is a circuit-breaker which is set so that it will carry—so set carrying a certain number of amperes of current so that it will carry an overload of that current for a given time, say thirty seconds, between twenty and thirty seconds is generally allowed—in some instances more and in some instances less. After this time why the circuit-breaker will go out.

Mr. J. HELLENTHAL.—May it be understood, your Honor, that [97—28] all of the testimony bearing on the matters now in this connection, goes in over my objection incompetent, irrelevant, and immaterial, and my further construction of this contract—must be governed by its own terms by the Court and not by customary matters of usage.

COURT.—The objection is overruled and exception allowed, and it will be also further understood that an objection will be allowed—or an exception will be allowed to all this class of testimony that may be received by the Court in this case.

Q. (By Mr. SHACKLEFORD.) Now, Mr. Thane, I wish you would explain to the Court the result of the conditions in the present case if a time

(Testimony of B. L. Thane.)

relay circuit-breaker were used upon the connection of the plaintiff's power line with the defendants' power-house?

A. Time relay circuit-breaker was installed upon their trunk line at the Treadwell or Sheep Creek power-house never have any difficulty in starting and if there was a wattmeter on their board they would never have any difficulty in cutting us off if we drew over 300 horse-power; never have to bother them in any kind of way and run right along and never draw over 300 horse-power except in the starting surge for an instant.

Q. About how long does this starting surge last?

A. Just for an instant. The sudden rush of the current is almost instantaneous measured by their own ammeters and wattmeters and it slows down within a very few seconds, down to normal amperage.

Q. Now, Mr. Thane, disregarding for a moment the difficulties that are connected with the delivery of an uninterrupted current of 300 horse-power, that is: the technical difficulties [98—29] of that delivery where it is connected with a larger plant, supposing the defendant companies in this case should deliver to the plaintiff an actual uninterrupted current of 300 horse-power, what would the result be with reference to our ability to operate the machinery on the power lines at the Perseverance or any other point of your line?

A. You mean a 300 horse-power load?

Q. Yes, sir.

(Testimony of B. L. Thane.)

A. Be able to start and operate.

Q. Under the conditions set by the defendants companies in their delivery of the power in this case, that is so far as an instantaneous circuit-breaker set at 56 amperes, is it possible to secure the actual use of 300 horse-power? A. No, sir; it is not.

Q. When did you have your first difficulty in starting the machinery at the Perseverance mine under the circumstance of delivery?

A. The morning after Christmas.

Q. When did you close down before that?

A. When did we close down?

Q. Yes, sir.

A. We closed down the morning of Christmas day.

Q. That closing down was voluntary, as I understand? A. Yes; voluntary.

Q. It wasn't due to any surge of current?

A. No.

Q. Now, from the time the Perseverance mine started in the early part of December until the closing down on the morning of Christmas day, what have you to say with reference to the consumption of power by the—from the lines or from the powerhouse of the defendant companies? [99—30]

A. We, at first, before the fire—

Q. (By the COURT.) The time of the fire hasn't been fixed.

Q. (By Mr. SHACKLEFORD.) What time?

A. The fire was on the 4th, I believe, of December.

Q. (By the COURT.) Of December?

A. Yes; 4th of December; I think it was the morn-

(Testimony of B. L. Thane.)

ing of the 4th about one o'clock if I recollect right.

Q. (By Mr. SHACKLEFORD.) Well, after the fire you started up?

A. After the fire we started up and we were using about 225 horse-power, I think.

Q. That is it approximately; that is the consumption? A. Yes.

Q. That is what this power line was put to?

A. Yes; that is what we were using.

Q. Now, I wish you would explain to the Court the method which the defendant companies have adopted in this case of penalizing or whatever you might call it—the method which has been adopted of storing current under your contract to deliver you an uninterrupted current.

A. Why, I took the matter up with Mr. Kinzie as soon as we found we were unable to start. The day after Christmas we tried it and kicked out the switch. I didn't care to inform him about it all the time and informed their power-house down there and wanted to know why we couldn't start, and I asked Mr. Kingsbury, I think, their power-house man, if they couldn't let us hold in their switch and let us start and he said no; he had orders from Mr. Kinzie that couldn't be done, and I called up Mr. Kinzie and asked him about it and he said yes; they were not going to allow us a starting surge, and at the same time I asked him over the 'phone if [100—31] he was going to keep this 56 amperes based on unity power factor, and he said he was. Then I told him we were going to try it, if possible, by means of a

(Testimony of B. L. Thane.)

flying-switch, start up with our gas engine, which was unable to pack the load continuously and then take the Treadwell line. We tried it several times and then he suggested that we might synchronize with them, which is rather an unusual thing with a gas engine, and we were unable to do it, and later on, by the way when I called him up to get the switch in again he spoke of this. I told him we were getting ready to synchronize with the gas engine or at least try to and he warned me what the effect would be over there if anything should happen—what the damages would amount to.

Q. (By the COURT.) “Over there” you mean where?

A. Over to the Treadwell line, that is anything happening by our trying to synchronize with them. We didn't think with a gas engine they would even let us try it. Very difficult thing to do anyway, particularly with a gas engine of that type. And I also asked him if he was going to insist on us notifying their head office over at Treadwell every time this switch was kicked out and he said he was, and it was after that I asked you to have an interpretation of the contract made. Of course, you can see what the effect is on us—every time anything happened we have to call up the Treadwell line and then they have to send a boat over across the channel no matter what the weather is to get over to the Sheep Creek plant and then throw the switch in. The reason for that I can't understand. They have a man at the powerhouse, who is certainly able to do it. [101—32] It

(Testimony of B. L. Thane.)

is a very great inconvenience, for instance last night it kicked out at half-past two and we were unable to get anybody on the island until this morning at nine—unable to get anybody who would waken Mr. Kinzie. That is an illustration of the situation of it. Our crew were shut down in the mine from half-past two last night until nine o'clock this morning.

Q. Now, how much experience, Mr. Thane,—what is necessary to put that circuit-breaker in so will—you understand—how much technical education is required?

A. All it takes is a man to grip hold of a handle and shove it in, that is all, and the same man that they have at their power-house throws in all of their circuit-breakers. They don't send a man over for that purpose—just for ours.

Q. Mr. Thane, you mentioned the circuit-breaker going out again last night. Just state the condition under which it went out last night.

A. Why, it wasn't our fault. There was a short circuit or something on their line which dropped the voltage and that kicked it out and they threw our line back in—threw our switch back in a few minutes, so the lights were on, but we couldn't get power to start on—a starting surge.

Q. That is, you couldn't get anybody?

A. No; couldn't arouse anybody. Mr. Pullen tried the power-house; he is my head electrician—and they said they wouldn't have authority to throw the switch in unless notified by Mr. Kinzie. Tried to get Mr. Kinzie and the watchman over there said

(Testimony of B. L. Thane.)

he wouldn't waken him at that hour of the night, and that was the way it went until this morning. [102—33]

Q. Do you know of any other place, Mr. Thane, in this vicinity where you could purchase electrical current for this operation? A. There is not.

COURT.—I will say at this time that pending this hearing I didn't intend that my order entered the other day should work as it apparently did work last night. If some one has to sleep, some one else should be appointed to whom notice can be given. If some one had to leave the defendant companies' plant for Seattle or Los Angeles, I wouldn't expect this notice to be given to that person, but some one else should be substituted as I want the spirit of the order complied with.

Mr. J. HELLENTHAL.—Your Honor doesn't understand the situation, I think; probably Mr. Thane doesn't understand it, but a short circuit came in last night and the men were busy all night working until this morning locating this short circuit. Wasn't any question of disregarding your Honor's order, or sleeping, or anything of that kind; simply a matter of electrical engineering—the steam plant was out and everything else was out.

COURT.—Well, that wouldn't change what I mean—what I said. Of course, if the power couldn't be furnished, I have no criticism—just a statement of the facts of it—a little amplification of what the order meant when it was entered.

(Testimony of B. L. Thane.)

Q. (By Mr. SHACKLEFORD.) Go ahead, Mr. Thane.

A. If it please, your Honor, we don't wish to be unreasonable about it either, because it is very disagreeable.

The COURT.—I don't wish to go into that part of it.

A. (By the WITNESS.) There is no question they could have given [103—34] us an order to get it because they put the switch there and the Sheep Creek plant was running and gave us lights—so far as their starting the plant is concerned or any other of their plants or the line wouldn't have prevented them from giving us the power to drive our plant last night immediately.

Mr. SHACKLEFORD.—I think that is all at the present time.

Cross-examination.

Q. (By Mr. J. HELLENTHAL.) Just one question before we adjourn for dinner, your Honor. Mr. Thane, do you know the Sheep Creek switch went out last night? A. The Sheep Creek switch?

Q. Yes.

A. I don't know about the Sheep Creek switch. I know ours went out.

Q. The circuit-breaker of the Sheep Creek power plant didn't go out last night, did it?

A. I think it did because Mr. Pullen told me this morning. I asked him about it and he has been working all last night trying to get somebody on the line and he said ours went out and theirs went out.

(Testimony of B. L. Thane.)

Q. You don't know anything about it from personal knowledge?

A. No; except Mr. Pullen who got in touch with them. He is my electrician, however.

Mr. J. HELLENTHAL.—That is all.

COURT.—No cross-examination?

Mr. J. HELLENTHAL.—Oh; it is only half-past eleven. I thought it was half-past twelve.

Q. Mr. Thane, what form of motor did you say you were employing [104—35] first, one question, all the work you have been testifying to that is under way by you is being carried on at what is called the Perseverance mine, is it not, Mr. Thane?

A. Yes; the Perseverance and Sheep Creek. Both places.

Q. Well, the drifts you are running and the raises you are making—the tunnels you are driving are all being driven in that Perseverance tunnel, isn't that true? A. Driving one tunnel at Sheep Creek.

Q. Now, what you have been testifying to—but the work at Sheep Creek? A. Yes.

Q. That was never one of the Oxford properties?

A. What is that?

Q. That was never one of the Oxford properties?

A. No.

Q. The Oxford Mining Company never had any interest in the Perseverance until this recent consolidation?

A. No, except that part of the development work we are doing is part of the Oxford and the Ground Hog group of claims adjoins it.

(Testimony of B. L. Thane.)

Q. You are not working in the Ground Hog group of claims any, to speak of?

A. We have actually worked in some of it and the stope is cut out in the Ground Hog claims. The stope where the Oxford has got their ore-way is in the Ground Hog claim which is part of the Perseverance.

Q. The place where your 200 men, or so, are now working is at the Perseverance property, isn't?

A. No; partly at the Perseverance and partly on the Ground Hog.

Q. How many men have you got employed on the Ground Hog?

A. I should say—I should say pretty close to a third part— [105—36] a third or a half.

Q. What are those men doing? A. Raising.

Q. Raising? A. And sinking.

Q. And sinking. A. Yes.

Q. All right. Now, what is the form of motor did you say—you have a General Electric form K motor, have you not? A. Yes.

Q. 200 horse-power? A. Yes.

Q. And you testified that was a motor in general use? A. Yes; a motor in general use.

Q. For the purpose of driving compressors?

A. For compressors of that size, it is; yes.

Q. Now, Mr. Thane, will you state whether or not you have had some mining experience—will you tell me what kind of compressors you have ever seen driven by form K motor, except the motor you have there at the plant where you are working?

(Testimony of B. L. Thane.)

A. Well, I will tell you about that—I don't recall having definitely looked at any definite compressors, but I will tell you one thing before we ordered all of the moters and all of our electrical equipment for the special purposes for which we use it, it was passed on by two of the best electrical houses and—

Q. Wait a minute, Mr. Thane; answer my question. I don't want to know who it was passed on it or advised you. You answered the question of Mr. Shackleford to the effect that is a form of motor in general use for the purpose of driving compressors? [106—37]

ing compressors. I said it was a form of motor in general use and I know it is in general use although I can't recollect any special place. It is used to drive small compressors and all such machinery as that.

Q. I am not asking you where did you ever see a General Electric form K motor in use for the purpose of driving a compressor?

A. I can't recollect a place.

Q. You don't know of any place?

A. Not just now.

Q. That is the only one you have ever seen. Now, Mr. Thane, you also stated that the form of circuit-breaker in general use on distribution lines, such as the Sheep Creek line, was a relay circuit-breaker?

A. I did.

Q. Time relay circuit-breaker? A. Yes.

Q. I will now ask you where did you ever see a

(Testimony of B. L. Thane.)

time relay circuit-breaker in use on a distribution line?

A. I have seen them at a good many power-houses.

Q. Where?

A. For instance, I have seen them at the Sheep Creek power-house.

Q. When did you see a time relay circuit-breaker in use at the Sheep Creek power-house on the distribution line?

A. They have them on their main line.

Q. The main line is not the distributing line though?

A. Yes; it is certainly. The main line has to run out; so do the distributing lines—to the various motors that come off of that line. [107—38]

Q. Did you ever see a time relay circuit-breaker in use here in Alaska or elsewhere in the distribution of electric current over a distributing line such as that with which you are connected with at the Treadwell power-house?

A. Yes; the same line goes through at Treadwell, that is a distributing line.

Q. Now, where did you see that?

A. I saw that at the Sheep Creek power-house on their panel.

Q. Now, where else?

A. Well, all I know is that on their main circuit line they use the time relay to go into their own power-house. You will see them even in a good many power-houses at different times—

Q. Is it not a fact—?

(Testimony of B. L. Thane.)

A. —even in a good many power-houses in the states and all about there, they have time relays on their main line.

Q. Well, I am speaking of the distributing line?

A. The main line is the distributing line; as a matter of fact, it is the line which carries your current out and then feeds off to the various motors which you use from them.

Q. Where are the lines which feed to the various motors, if you want to use that form—where did you ever see a time circuit-breaker in use?

A. Down here at Sheep Creek at your own power-house.

Q. On the line that feeds the motor from the main line?

A. That is your main system and your lines run from that to your motors.

Q. Now, let's get at this, Mr. Thane. Is it not a fact that the time relay circuit-breaker is a recent invention, comparatively [108—39] recent; that was installed only in connection with main lines that ran directly from the power-house to the distribution line for the purpose of giving the main line a chance when the other line goes out—so the feeder will go out before the main line?

A. You mean from a generating plant?

Q. Yes; a generating plant. A. That is true.

Q. That is true, is it not, Mr. Thane?

A. Our line comes off from your generating plant just the same as your line comes off from your generating plant; just exactly the same.

Q. The line connects—

(Testimony of B. L. Thane.)

A. Just the same as the line cuts off from Sheep Creek and distributes up here to the Alaska Juneau.

Q. Understand my question. The purpose of a time relay circuit-breaker is not to regulate the distribution of electricity but merely to give the main line a chance to stay in for a few minutes, if the other ones go out, is that not true?

A. Not regulating the distribution of the electricity.

Q. Now, for instance, you know probably that the Treadwell Company have a time relay circuit-breaker at Nugget Creek?

A. Yes; I presume they have. I haven't been there.

Q. That is the only—probably also knew that is the only time relay circuit-breaker they are using?

A. They have one at Sheep Creek.

Q. Except the one at Sheep Creek?

A. Haven't they got one from their steam plant too? [109—40]

Q. I don't know about the steam plant. I am speaking about their power plants. A. Yes.

Q. Now, from these main lines lead various distribution lines to the various motors?

A. Well, you may call them distribution lines. May be only one motor cuts off from that main line; may be the main line—what is it you are driving at—is a distributing line. Suppose only have one line going off to one line?

Q. Then there is no distributing line?

A. Then your main line is the distribution line.

Q. The main line furnishes power?

(Testimony of B. L. Thane.)

A. Main line is a distributing line.

Q. Doesn't the one distribute more than to the use of more than one motor. What would there be to distribute if didn't have more than one?

A. That is quite true, but your main line is the distributing line.

Q. Now, where lines lead from the main line they are usually called distributing lines—they distribute from the main line to the various motors? You know that is so?

A. No, they are distributing lines, also are main lines—just because you may have minor ones coming off from—

Q. Now, granting that the time relay circuit-breaker is used in connection with the main system, now did you ever know of a time relay circuit-breaker being used in connection with the minor system, as you call it? A. Certainly, I have. [110—41]

Q. Where?

A. This is just—the Sheep Creek plant is just a minor unit of all your units. There is one place right there.

Q. Well, now, Mr. Thane, let's understand each other. There is a main line running from Sheep Creek, is there not—a main electric line?

A. Yes, and it connects with another line from Nugget Creek.

Q. Yes, I understand, but just lose sight of Nugget Creek. There is a main line coming from Sheep Creek, is there not? A. Yes.

Q. On that main line there is a time relay circuit-

(Testimony of B. L. Thane.)

breaker, isn't that true? A. Yes.

Q. Now, on that main line are minor lines branching out to the various motors, are there not?

A. I suppose there are.

Q. Now, you have in your mind a clear distinction between the main line and the minor line, or what I call the general main line and the distributing lines. What I refer to as distributing lines are what you call the minor lines. Now, having that in mind, did you ever see a time relay circuit-breaker in use on a minor or distributing line in the sense that we are now using the term?

A. Why, I don't recall; but what you are driving at is whenever a line comes out of the generator it has a time circuit-breaker on it.

Q. No.

A. Yes; that is so because really your line is coming out of a plant where you are generating electricity and that is where you would have a time circuit-breaker; yes; all [111—42] right then, so our line will come out from your generator and right from the same generating house.

Q. You think that answers my question?

The COURT.—He answered that he had not seen it.

Q. (By Mr. J. HELLENTHAL.) Now, Mr. Thane, you are familiar with the form M and form P motors, are you not?

A. Yes; the form M; I never used the form P.

Q. Those are motors—form M and form P—are

(Testimony of B. L. Thane.)

usually used in connection with driving?

A. Not especially so; in fact form M is an especial motor with outside resistance and it especially provides for starting without a heavy starting surge.

Q. Exactly.

A. But it does take some starting surge. Though it doesn't entirely eliminate the starting surge it requires some, but not as much as the form K, and it has extra devices for that purpose, which are in some ways against the motor ruining it for practical purposes and it is not in such general use by any means as form K in ordinary practice.

Q. By a starting surge, you mean a starting peak or extra starting current, don't you?

A. Yes; but it is a different thing from the ordinary peak load; entirely different thing.

Q. Where did you get the use of that word "surge" from?

A. Oh, a surge is an ordinary English term which expresses the real meaning. It is a rush of current—the instantaneous rush of current—you can use surge; it carries the idea; a word that is in ordinary practice.

Q. You have no other distinction or meaning of that term?

A. No; it is just an ordinary term for that purpose. [112—43]

Q. You don't mean by surge an increase in the amperage? A. Yes; I mean—

Q. And voltage?

A. I mean the increase of current.

(Testimony of B. L. Thane.)

Q. You know as a matter of fact—

A. The rush of current.

Q. Why?

A. As a matter of fact, your voltage doesn't increase. It drops. Your current does increase on the start.

Q. Now, that is a surge? A. Yes.

Q. When your current increases and your voltage diminishes? A. Yes; that is right.

Q. You will get a surge?

A. That is the result; yes.

Q. The surge doesn't deal with horse-power. Mr. Thane?

A. Yes, deals with horse-power. If you measure it in watts the result—instantly there would be a raise in the amount of watts used instantly.

Q. There wouldn't be in a surge? Surge deals with capacity does it not and not with horse-power?

A. Well, horse-power is—horse-power depends so far as the electric current depends upon both—on the voltage and amperage.

Q. How is that?

A. And with other factors, but it depends on both of them, but in the ordinary meaning of surge—in the ordinary mind what you mean is the rush of current, that is what you mean—an extraordinary rush of current—a sudden rush of current. What actually occurs when that rush of current. [113—44] —what actually occurs when that rush of current goes through your line is the voltage drops, unless the voltage is kept up in some other appliances on your

(Testimony of B. L. Thane.)

bus-bars such as you have at Sheep Creek—there is an extra appliance there for the purpose of keeping the voltage up; otherwise it would drop.

Q. Now, how much horse-power, Mr. Thane, does it take to start your form K motor? A. Form K?

Q. Yes.

A. I don't know—that motor will start with considerably less than 300 horse-power. It will start with—it will start with 200 horse-power.

Q. If you get 200 horse-power.

A. It will start.

Q. —you can start?

A. Yes; on even less than that it will start all right enough.

Q. How much horse-power does it require to start you a week ago—three or four days ago when you started—do you remember that experiment?

A. Yes.

Q. Took about a 1,000, didn't it, Mr. Thane?

A. No, sir; it did not.

Q. Were you in the power-house when you started it?

A. No; but we have our own ammeters, voltmeters and wattmeter on our own board and had check-men to read them. Never took any such thing as that.

Q. How much did it take?

A. Why, a little. If measured that way I think your voltage holds up—your voltage is held up.

[114—45]

Q. I see; has to be—

A. No; doesn't have to.

(Testimony of B. L. Thane.)

Q. How would you go to operate a loaded motor?

A. Well, I will just tell you. Suppose you had a generator—a 300 horse-power generator which is now at the Sheep Creek plant—

Q. Yes.

A. —with a pipe-line that would only deliver 300 horse-power to us—

Q. Yes.

A. —you started that up and run it. You can't draw any more than 300 horse-power—that will start every motor on our line and work up to full capacity, but when we start this is what happens—

Q. Burns out the generator?

A. Not by any means.

Q. Well, what happens?

A. What happens—your amperage runs up and your voltage runs down and temporarily the machine slows up until the motor gets its speed; then both the motor and the generator come up to speed and that will happen within twenty seconds and we will get the full power out of it. No question about it.

Q. All right.

A. As it stands you have an outside—

Q. You get that same result, don't you, Mr. Thane, to a limited extent from the compressor that you have? A. You do so.

Q. To reduce—you have a compressor on that motor? A. Yes.

Q. That reduces your voltage? [115—46]

A. Yes; to a certain extent. We have a starting device for the purpose of starting up.

(Testimony of B. L. Thane.)

Q. How have you got that compressor set—how are you using it up there?

A. Using it according to ordinary practice; haven't watched them start that in person; have an electrician who has direct charge of that; haven't any occasion to doubt that he used the ordinary practice.

Q. What is the ordinary practice?

A. Well, it is to throw it over on one side of the feeder and then throw it back, the idea being to reduce the voltage temporarily somewhat, but that isn't sufficient—

Q. You can reduce the voltage more or less on the compressor? A. Somewhat.

Q. According to the way you have the thing set, Mr. Thane, can't you?

A. Somewhat, but it isn't sufficient to start out when we have it set at unity power factor—56 amperes down there—that loss of current is almost instantaneous; that extra current that comes over their line is just like a flip (indicating) and that connects with your motor which is—well in just a little bit. Why, we start it all right and we didn't use over the 300 horse-power either.

Q. You would be using over 300 horse-power while you were starting, wouldn't you?

A. No; we would not. [116—47]

Q. You would not use over 300 horse-power?

A. No; I don't think we would; don't think you could measure it. You must remember that the indicator—these indicators that measure both the amperes and the volts and the watts are all—are very

(Testimony of B. L. Thane.)

delicate contrivances and fluctuate back and forth all the time, and in a second, or less one of these little needles will rush up like this. Now to try to read the high point that gets to in coming without taking the impetus that would receives to throws the current to that point; on the other hand you try to read the average of these which would give the current thereof; but what I do know is it does not take 300 horse-power to start that motor with ordinary conditions.

Q. It doesn't? A. No; it does not.

Q. And yet you know, Mr. Thane, that the circuit-breaker on your line is so set as to permit 300 horse-power to pass out and place 300 horse-power at your disposal? A. No, sir; I know it is not.

Q. It is not? A. No, sir.

Q. Now, tell me why it is not?

A. Well, that circuit-breaker—I will tell you—the Sheep Creek lines are in synchronism with your Nugget Creek and your Treadwell lines, when the steam plant is running. Now, I don't know what the power factor is over there. I know this, if we connected up with your line it would be affected as long as drawn off from that same synchronized current, we would be affected by your power factor, bound to be and couldn't get away from it. [117—48]

Q. Why?

A. Because we would connect up with the same juice that is in synchronism, so then we apply and receive part of it and we would be affected by your power factor and we don't even know what our own

(Testimony of B. L. Thane.)

power factor is except by taking an instantaneous reading. You see. Now, that power factor is going to effect what that power is. You have assumed a unity power factor. Your own generator I think is only set at 85 per cent power factor and yet you are allowing unity power factor for us, a theoretical condition.

Q. Assuming a unity power factor, Mr. Thane, there is 300 horse-power placed at your disposal, is there not?

A. If that condition exists, but it doesn't exist; that is the point.

Q. If what condition?

A. If the condition of unity power factor exists we would get it.

Q. Assuming a unity power factor.

A. If that condition did exist, but it doesn't, we would get—we could get 300 horse-power if had all the certain special devices that we would have to install.

Q. Now, what you mean, Mr. Thane, is this: While there is 300 horse-power placed at your disposal at Sheep Creek on the bus-bars—

A. There is not 300 horse-power.

Q. Now, wait a minute now until I get through, you will probably agree with me—you are not able to develop that into 300 developed horse-power?

A. There is not 300 horse-power placed at our disposal.

Q. Well, now, what is a horse-power, an electrical horse-power? [118—49]

(Testimony of B. L. Thane.)

A. It is seven-tenths of an ordinary horse-power; that is just the reverse ordinary horse-power is about seven-tenths of an electrical horse-power, being .746 kilowatts.

Q. You know the voltage at Sheep Creek, don't you, Mr. Thane? A. Yes.

Q. And you are familiar with the plant and the system down there?

A. I have been in the plant to see it.

Q. How did you figure the horse-power to be delivered down there?

A. I will tell you what we did down—

Q. How would you set that circuit-breaker to deliver 300 horse-power? A. To our line?

Q. Yes.

A. I will tell you exactly. The first thing I would put in would be a wattmeter, which doesn't register horse-power; right alongside of that I would put an ammeter. Now, with our loads there are on the line and the load, I would shove it up to where it would be the equivalent of 300 horse-power, which would be about 240 kilowatts. When 240 kilowatts showed on the wattmeter I would see what the ammeter read—how many amperes there were, and I would set my time circuit-breaker in accordance with the ammeter, and then I would correct that from time to time according as I had more motors on that line or to sustain more motors. That is the way it would be done, like that.

Q. Now, that wasn't exactly my question, Mr. Thane. We will get at that question. How would

(Testimony of B. L. Thane.)

you set the instantaneous [119—50] circuit-breaker in order to permit our motor to place at the disposal of the party or at the disposal of the line 300 horse-power? A. Why, I wouldn't set it.

Q. I understand, but if you were to set it, at what point would you calculate?

A. I wouldn't do it; I wouldn't do it.

Q. Well, how would you calculate the horse-power? A. The horse-power?

Q. Yes; you know the voltage and the amperage and all about it. Now, how would you calculate the horsepower?

A. I wouldn't calculate it. I would put a wattmeter in and then find out what it actually was. You can't calculate.

Q. Now, you know that an electrical engineer can calculate horse-power?

A. They can if they have certain factors and they can't find those factors without making actual tests for that purpose, or to have a wattmeter to see what we are doing.

Q. You know books of electrical companies give you formulas and tests which you use to figure horse-power?

A. On certain conditions and where certain facts are known?

Q. What facts?

A. Well, the first thing, do you know the power factor on your line?

Q. Do you know the power factor on your line?

(Testimony of B. L. Thane.)

A. No; I don't. I could figure it for a given instance.

Q. If you changed form K motor to form M motor be a different power factor? A. No; not a bit.

Q. Are not?

A. No, sir; there is exactly—the form M and form K motors [120—51] is exactly alike with one exception; that is one has an outside resistance for the use of starting; otherwise the motors are exactly the same type.

Q. All right. What is the power factor in a synchronous motor?

A. Well, a synchronous motor is figured to build up and allow a unity power factor.

Q. Exactly? A. Yes.

Q. If you used synchronous motors you could get 300 horse-power out the juice that is delivered to you from the bus-bars there, could you not—the power factor would then be unity, would it not?

A. The power factor would be unity using a synchronous motor.

Q. You would get your 300 horse-power, wouldn't you? A. Under certain conditions we would.

Q. You would get it off the power that passes and wouldn't knock out your circuit-breaker?

A. That hasn't got anything to do with the circuit-breaker. You have got to start a synchronous motor just the same as form M or form K.

Q. If your machinery was started you could utilize the entire 300 horse-power?

A. Yes; I think we could. I would have to con-

(Testimony of B. L. Thane.)

sider it. I think we could.

Q. If you would use that power for the purpose of electric lighting you could use the entire 300 horsepower, couldn't you, Mr. Thane?

A. Yes; if for electric lighting only.

Q. The power factor would be unity, would that not be true? [121—52]

A. Yes; in electric lighting.

Q. Isn't it a fact that the power factor depends entirely upon the use to which the current is put?

A. It does.

Q. And it is controlled by the use to which party using it? A. Yes.

Q. And is beyond the control of the party furnishing the current, is it not?

A. Yes; but wait a minute. One another thing, the power factor doesn't affect the actual horsepower delivered to us, not a bit; whether used for electric lighting and had a power factor of 70 per cent wouldn't affect the actual horse-power that we were getting; not a bit.

Q. It wouldn't affect it? A. No.

Q. The amperage and voltage?

A. By the power factor?

Q. Yes; if you—for instance, the circuit-breaker is set at 56, is it not, down at Sheep Creek?

A. Yes; figuring at unity power factor.

Q. Figuring at unity power factor? A. Yes.

Q. Figuring at unity power factor you are getting 300 horse-power, are you not, if that is placed at your disposal?

(Testimony of B. L. Thane.)

A. Figuring at unity power factor we could get out that; yes.

Q. There is 300 horse-power placed at your disposal? A. I think we could; yes.

Q. From the bus-bars? A. Yes, sir.

Q. Now, if you used your juice for electric lighting purposes [122—53] there is—the power factor would be unity, would it not? A. Yes.

Q. If you used a synchronous motor, the power factor would be unity? A. Yes.

Q. If you used a form K motor, the power factor—you don't know what the power factor is?

A. No.

Q. And if you use a form M motor, you don't know what the power factor is?

A. Well, you can figure it from your instantaneous readings.

Q. By experiment?

A. No experiment, by instantaneous readings of your ammeter and voltameter, but you understand if suppose we only had 70 per cent power factor, using a form M or form K motor, we wouldn't be getting any more actual horse-power than we would if we were taking that power over the line at unity power factor; you understand that doesn't diminish; in other words, you wouldn't be losing any horse-power coming over your lines whether we used it on motors, either form M or form K; not a bit.

Q. Provided you didn't take over 300 horse-power off the bus-bars? A. Exactly, in either case.

Q. In either case?

(Testimony of B. L. Thane.)

A. Yes. It wouldn't be affected because we had type form K or form M motor or using a synchronous motor.

Q. The only difference would be you wouldn't be getting that much power?

A. No; that isn't the point. As under the present condition [123—54] you are not giving us the power—you are not giving us 300 horse-power, if we were going to use lights and had 56 amperes on that circuit-breaker and allow us to start our juice, turn it into lights, we could draw 300 horse-power from you; see?

Q. Yes.

A. But on the ordinary way—with ordinary motors we are called upon to use 300 horse-power—you are the ones that are receiving the actual difference between what we ought to receive and what you are delivering us; so we are not the gainers. We are losers on that.

Q. In either case the 300 horse-power figured at unity power factor would be at your disposal on the bus-bars?

A. At unity power factor, provided you allow us to start.

Q. Yes or no?

A. For one purpose alone that would be, and that would be for lights.

Q. How about a synchronous motor?

A. Oh, very well, a synchronous motor—if we put that synchronous motor in there that synchronous motor would not alone be affected by our power fac-

(Testimony of B. L. Thane.)

tor for would be figured at such, but our power factor would be affected so long as your system is in synchronism with Nugget Creek and the power over there, and I wouldn't know how to figure what kind of synchronous motor have to use for that purpose, and there is an especial device, too.

Q. I wish you would explain to the Court, Mr. Thane, just how our power factor affects you—how it affects the flow of current that passes onto your line that you can get from [124—55] our bus-bars.

A. I will tell you. The power factor is a condition, Mr. Hellenthal, nothing else; it is a condition in the line due to induction loads, for instance, induction motors, and it is due to the lag of the—what is the word I want to use—the current keeps back its direction so many cycles.

Q. Yes.

A. It is due to the lag of that current. Now, this condition of power factor exists—how power factor is—if we brought the power factor up to unity, don't you see, it would help—it would help your generator in your plant and not us; that would be the plant would be helped—your generator—by bringing it up, if we were able, which I doubt it would be possible for us to do on account of your own induction motors which you have on your system—if we were able to do that, say that we were, it would be your generators at Sheep Creek which would be helped; that is the thing which would be helped; that is, they put

(Testimony of B. L. Thane.)

these synchronous motors on at times to help the generator, so that the generator has more capacity, that is to say, that you can put more power against it and it can generate some more current. It helps out the generator so and extends the capacity without heating; that is why they put these synchronous motors on the line to help the generator.

Q. That is the only explanation you have to offer how our power factor on our power line would affect the distribution of electricity over our bus-bars?

A. Well, I answered that; so long as our system is taken off your line, which is in synchronism that will continue to [125—56] be affected by the same things which exist on your line, and it will be affected by your power factor, and now your power factor is not unity. It is about 70.

Q. Now, Mr. Thane, my question is whether or why should that be affected?

A. Because it is connected with your general system and also your induction motor over there affects your system and there affects us.

Q. (By the COURT.) In what way?

A. Because it is a part of the same system. It is just the same as any part of their system over there and it is connected with it and it is in synchronism.

Q. (By Mr. J. HELLENTHAL.) Isn't it quite possible, Mr. Thane, for a branch line to have a unity power factor and the power factor on the main line be something else?

A. I don't think so. I know so long as our line comes off from your bus-bars—comes off from your

(Testimony of B. L. Thane.)

bus-bars and your Sheep Creek plant is in synchronism with your Nugget Creek and your steam plant there and your system has a certain power factor due to its induction load, due to the various motors which you have on it and other conditions, and we feed off the same bus-bars, I can't see why our line isn't affected by the same power factors that yours is, and I believe it is.

Q. You give it as your opinion that it is?

A. Yes; I give it as my opinion that it is and in order to correct that power factor have to correct the power factor for the whole or in order to bring ours up to the unity. That is the idea. What would be helped would be the generator.

Whereupon Court took a recess until [126—57] two o'clock of this same day; and thereafter court again convening pursuant to adjournment, all parties being present as heretofore, further proceedings were had, as follows:

Q. (By Mr. J. HELLENTHAL.) Mr. Thane, before lunch I was inquiring of you concerning the matter of power factors. For the purpose of clearing up the record I wish to ask you what you mean by power factor—by the term power factor?

A. Power factor is the ratio between the apparent power and the actual power.

Q. It is the difference, Mr. Thane, between the power actually produced in the first instance and the power present on the line? A. No.

Q. And the power utilized or developed, is it not?

A. No; it is the ratio between the two.

(Testimony of B. L. Thane.)

Q. The ratio?

A. The way I understand it, Mr. Hellenthal, is this: There is, so to speak, in the line a wattless current which is caused by an induction load, that is, when you speak of an induction load meaning a load of the induction motor and that this wattless current exists in the line all the time. It doesn't produce power at all; not a bit. It doesn't make power. It exists in the line and it is due to the lag which is caused by the phases from the alteration of the line, but it doesn't produce power; not a bit. Now, the idea of trying to get unity power factor—

Q. Now, before we go on with that, Mr. Thane, I want to get this matter so I understand what you mean by power factor clear. [127—58]

A. Yes.

Q. Is not this your understanding of a power factor, that it is the ratio between the power generated and taken from the bus-bars and the power actually developed?

A. No; it is the ratio between the apparent power and the actual power. The only power you could get from the bus-bars would be the actual power, that is, all you could get from the bus-bars would be the actual power because that is all that would go there.

Q. Doesn't it represent, Mr. Thane, the power that is lost in developing? A. No, not all.

Q. The power not utilized?

A. No, not at all. It is not a question of efficiency at all. There is no lost power there; not a bit.

(Testimony of B. L. Thane.)

Q. In the case of using power in connection with the operation of a synchronous motor? A. Yes.

Q. Or in connection with the development of electric light? A. Yes.

Q. The power factor is unity, is it not? A. Yes.

Q. That is to say the actual power obtained?

A. Yes.

Q. Is the same as the power produced?

A. Yes, that is correct.

Q. That is correct, is it not?

A. Yes, but remember electric lights are not inductive loads and there is no condition which causes power factor in that system. [128—59]

Q. I know, but in the case of using an inductive motor, whether it be form K, form M, or form P, the power actually produced is not equal to the power generated in the first instance?

A. Yes, it is. Yes, it is.

Q. Well, put it this way then—it is not equal to the power that would be developed by a synchronous motor from the same current?

A. That is if you put a synchronous motor on the line why all you would correct would be the power factor, that is to say this condition in the line that is all that you would correct.

Q. You would have no loss? A. No, not a bit.

Q. In the case of an inductive motor there is always bound to be a loss of more or less, is that not so?

A. No, not at all. It is only the loss that is due to the inefficiency of that machine—that is our loss

(Testimony of B. L. Thane.)

and not the loss of the line—at the circuit-breaker.

Q. We are not talking about line losses and things of that kind. What I am trying to get at is what is meant by power factor?

A. There is no loss due to the power factor; not a bit.

Q. There is no loss due to the power factor?

A. No.

Q. What figure does it cut?

A. Well, it is a condition of the line. Well it is—I don't know as I am capable of giving you an analogy.

Q. (By the COURT.) See if you can do it this way. You tell me there is power efficiency in one plant of 75 and in another 85. Now what makes the difference, if you know? [129—60]

A. Well, that is caused by a difference of your inductive load, that is the inductive motor you would have on your line would make the difference whether your power factor is 85 or 70 or 60. Now, this is what they tell you to do with your inductive load. You have to go back to your generator plant system—in your line you have a generating plant and the machine is designed to produce so many horse-power or so many kilowatts, and it also has to be designed that it won't overheat in carrying a certain amount of current—the machine won't overheat the phase wires in this generator, not motor—this is a generator, so it won't overheat, you understand.

Q. Keep from burning out?

A. Yes, and now very often when a company has a

(Testimony of B. L. Thane.)

generator of its own and a certain motor load distributed about—after a while it finds that it has a certain power factor on its line, say 60 per cent or 70 per cent. Now, that is this wattless current that is flowing through the line on account of the inductive motor that causes this power factor. Now, I could bring the power factor up to unity. The only results that you would get out of that is to increase the capacity of the generator—of your generator—of your own generator. Now, that doesn't mean that when you increase the capacity of the generator that you get more power out of it. The only way you can get more power out of it is by adding more power to the generator, you see, but that same generator which you had originally placed in there would, by bringing your power factor up to unity, be capable of generating more current, provided you put more power; that is, you correct this condition in there [130—61] and therefore your generator is in a condition to generate more power if you put more power on it.

Q. (By Mr. J. HELLENTHAL.) According to your testimony, Mr. Thane, the power factor existing in any particular case is due to a line condition?

A. It is a wattless current.

Q. Flowing in the line? A. Yes.

Q. And has nothing to do with the motors—the motors don't affect it?

A. The motors are responsible for that. The motors are responsible for that. They cause it, affecting the phases of the current as they vibrate, makes them lag a little bit, which causes this condi-

(Testimony of B. L. Thane.)

tion, but it isn't a question of a loss of power. Not a bit at all.

Q. It is a question of being able to utilize the power?

A. No; it goes back to the generator, that is all; it affects the generator, that is all.

Q. Don't affect the motor? A. No.

Q. If you are given 100 horse-power at a given place, how would you measure it?

A. Measure by watts.

Q. 100 horse-power, so many watts? A. Yes.

Q. Multiply by so many volts?

A. Amperes multiplied by so many volts.

Q. That gives you the horse-power?

A. Yes; the electric horse-power.

Q. But it doesn't make any difference what the horse-power is according to that view to have the required horse-power? A. Yes. [131—62]

Q. Is that true?

A. If—if—that would be true.

Q. Now, there is just one question, Mr. Thane, that I asked you about this morning. I want you to think it over carefully, because I want to say that there are some engineers here that don't agree with you, if you understood correctly. I want to know whether you understood correctly. Assuming that there is a certain power factor existing on your line in connection with the use of your form K motor attached to the Sheep Creek plant and assuming that your line is attached to the bus-bars, gets its power direct from the generator, you don't mean to say, Mr. Thane, that

(Testimony of B. L. Thane.)

your power factor is affected either one way or the other by the fact that the Alaska Treadwell Co. and the other defendant companies also have a wire attached to that same bus-bar and used inductive motors, so that there is a power factor existing inherent in their current? A. Yes.

Q. You don't mean to say that the power factor that exists in their current by reason of their motors that induces the power factor in that part of the electricity generated and which they used, in any wise affects the power factor that exists in your line, do you, Mr. Thane?

A. Well, I said that was my opinion, and I may be wrong about it, but I was looking at it this way. For instance, if we raised our power factor, we would necessarily change the power factor somewhat of the generator and as that generator is connected with their system so that their power factor affects it and would be changed. Now what [132—63] that change would be, I couldn't say offhand. That would be my opinion.

Q. Your opinion is that it would be so affected?

A. My opinion is that it would be affected.

Q. Have you any authority, Mr. Thane, upon electricity that would bear you out in that matter?

A. No, I can't think of any. That would take a specialist to analyze that particular condition. I am just considering the effect of our power factor with the effect on their generator.

Q. Can you now give to the Court your special reasons for your opinion on that subject?

(Testimony of B. L. Thane.)

A. I just tried to give it to you. Whenever our power factor in our line is changed it would change the power factor of the generator somewhat, have to do it, because the generator is a part of our system as well as theirs and in fact that generator is the same generator, is a part of their system. I can't see but what that would affect it—affect their system, or their system would affect it.

Q. Remembering always, Mr. Thane, that the circuit-breaker at Sheep Creek is so set, assuming that it is so set, as to permit the uninterrupted flow of 100 horse-power, then would it still be affected, your power factor, by the power factor on the defendant company's lines?

A. Well, I was of the opinion that it would. I may be mistaken about that. It is a very technical question. I was of the opinion that our power factor would affect the generator. I am sure that it would do that. I am sure that our power factor would affect the generator somewhat, just how you would measure that would be difficult, but would affect the generator which is part of [133—64] their system. Why there would be the effect all the way through. That is the way I arrived at that.

Q. Well, now, Mr. Thane, let's go off onto another subject again now. You know the voltage at Sheep Creek, do you not? A. Yes, approximately.

Q. 2300?

A. Between 2300 and 2400. They raise it sometimes.

Q. Well, assuming it is 2300. You know the am-

(Testimony of B. L. Thane.)

perage at which the circuit-breaker is set—56?

A. Our circuit-breaker, the one that is on our line?

Q. Yes, on your line?

A. Why, Mr. Kinzie told me what it was set at.

Q. 56? A. Yes.

Q. Now, Mr. Thane, that would permit the uninterrupted flow of 300 horse-power, would it not?

A. No, sir.

Q. Now, do you figure—well, let's go through to another thing— The electric unit is a watt, is it not?

A. Yes.

Q. 746 watts? A. Yes.

Q. Accordingly you mean horse-power, electric horse-power, that is right, is it not?

A. That is correct.

Q. A watt constitutes one ampere with the voltage at one, does it not?

A. Yes, the multiple of voltage by the amperes.

Q. Then if you multiply the number of amperes by the voltage you get the number of watts, do you not, Mr. Thane, is that no right? [134—65]

A. Yes.

Q. Then if the number of amperes is 56 and the voltage is 2300 and just one other element in a three-phase circuit, such is the case, and you are familiar with the plant there? A. Yes.

Q. You have to also multiply by the square root of three?

A. Well, in a three-phase system, also by power factor. You have to add that element too.

Q. (By the COURT.) What?

(Testimony of B. L. Thane.)

A. You have to multiply by your power factor.

Q. (By Mr. J. HELLENTHAL.) Now let's see.

A. You left that out.

Q. Do you mean to say, Mr. Thane, that in multiplying the number of volts—the number of amperes by the number of—by the voltage? A. Yes.

Q. You would not get the number of watts?

A. No, you have to multiply by the power factor as well.

Q. By the power factor as well? A. Yes.

Q. Where do you get your authority for that?

A. Well, that is—I think any up-to-date electric book will show that is the way you get your actual horse-power.

Q. All right. Let's see. Mr. Thane, I wish to call your attention to a book that I have here, The Standard Underground Cable Co., Pittsburg; I wish to have you look at that, and state whether you regard that as a standard work on the subject.

A. I wouldn't be able to say until I had taken it up and looked into it. [135—66]

Q. What. You can do that in just a moment, can't you?

A. This is apparently. It has price lists of insulated wire—apparently a catalogue, that is all.

Q. You wouldn't regard that as an authority?

A. Well, let's see. I haven't had a chance to see. No, I wouldn't regard that as an authority, because it is nothing more or less than a catalogue and covers many other subjects. Just simply goes into it briefly.

Q. All right.

(Testimony of B. L. Thane.)

A. Let me see what it has here.

Q. Yes, you may see it.

A. Remarks here "except where there is current electric motor force," you will notice at the bottom of that.

Q. Well, you don't regard that as an authority. We will turn to this one.

A. That thing there is considering power factor. It is right there.

Q. Now listen, Mr. Thane, I have a book here, Lectures of Mr. Briesdale. Look at that book and see if you regard that as an authority on electricity.

A. I wouldn't be able to say, Mr. Hellenthal. It looks as though it might be. It is apparently a discussion of alternating currents, or alternating current theory.

Q. Do you regard that as an authority?

A. I presume it would be, yes. I haven't any reason to say that it isn't, undertaking a discussion like that.

Q. Now, I call your attention to this part that I have marked on page 170 and ask you to look at it and say if that changes your mind any upon that subject. [136—67]

A. Yes, but this here mentions power factor.

Q. All right.

A. It discusses that it has two special conditions right here.

Q. Where the power factor is unity, Mr. Thane, how would you proceed?

A. Well, where the power factor is unity there

(Testimony of B. L. Thane.)

wouldn't be any lag.

Q. Yes.

A. For instance, this here takes into consideration "We shall therefore proceed to find the relation between the power and the current, and although would be possible to have all these to do we shall find it convenient to start with one special case. Firstly, when they are in phase." That is the point right there.

Q. All right, I think we agree, Mr. Thane. In determining the horse-power you multiply the number of amperes by the voltage by the square root of three in a three-phase machine?

A. A three-phase system, yes.

Q. And where the power factor is unity, you have nothing to multiply by?

A. You multiply by 100 per cent power factor.

Q. That doesn't change the result?

A. Well, then you get 300 horse-power, that would be the condition where your power factor was unity.

Q. Now, listen. Let's get back to the Sheep Creek plant. Now, the amperes that were delivered at Sheep Creek are 56, assume that.

A. Assuming that as so, I said, of course.

Q. The voltage is 2300? [137—68] A. Yes.

Q. Multiplying 56 by 2300 by the square root of three by one hundred per cent power factor, power factor unity, you get 300 horse-power, do you not?

A. It would if you had 100 per cent power factor existing there.

Q. We are assuming that.

A. Oh, yes, that is right.

(Testimony of B. L. Thane.)

Q. If the power factor is unity? A. Yes.

Q. You get 300 horse-power, is that not true?

A. Correct.

Q. If the circuit-breaker at Sheep Creek is so set as to connect the uninterrupted flow of 56 amperes, the voltage being 2300, with that three-phase machine that they are using there, assuming the power factor to be unity, you get 300 horse-power, is that not true?

A. It would, if the power factor was unity—it would.

Q. All right, now. Now, Mr. Thane, in the construction of a contract where no power factor is mentioned, do you know what the power factor is presumed to be?

A. Yes, it would be presumed to be what it actually was.

Q. What authority, Mr. Thane, on electrical engineering have you for that statement?

Mr. SHACKLEFORD.—We object to that question.

The COURT.—Objection overruled and exception allowed.

Q. (By Mr. J. HELLENTHAL.) What authority have you for that statement?

A. Just the authority of ordinary common sense.

Q. You have no other authority?

A. I don't know of any authority. Would you repeat the question again? [138—69]

Q. The question is this: In a case of a contract that mentions no power factor, is it not a fact that the

(Testimony of B. L. Thane.)

power factor is presumed to be unity?

A. I don't think so. I am sure it isn't.

Q. What authority have you ever seen that holds to the contrary?

A. Well, I don't recall any authority. The only authority that you can take would be the authority of ordinary practice.

Q. Where in ordinary practice have you ever seen such a contract besides the one at Sheep Creek?

A. Well, in ordinary practice, as a matter of fact, the way contracts are drawn up between electrical men and electrical companies things are accounted for, are spoken of.

Q. They are mentioned. The power factor is mentioned in the contract, is that not true?

A. Some contracts I presume that it is.

Q. But where it is not mentioned, is it not a fact that under all the authorities on that subject that the power factor is unity? A. Not that I know of.

Q. I have here a book called the Standard Handbook for Electrical Engineers, to which I call your attention. You probably regard that as a standard work, do you not, Mr. Thane?

A. It is a handbook.

Q. You are familiar with this book, are you not?

A. I have seen the book. It is a handbook. It is not an authority. It is a handbook, simply lays down certain points in connection with electrical appliances.

Q. Upon those points that it lays down it is regarded as authority, [139—70] is it not? Upon

(Testimony of B. L. Thane.)

those it is regarded as authority, is it not, Mr. Thane?

A. Yes, it is used for practical purposes.

Q. I now call your attention—

A. Sort of a quick reference book.

Q. I call your attention now to section 88 at the bottom of page 1171, Mr. Thane, and ask you to read that and see what it says. Read it out, Mr. Thane, so we can all hear.

A. It is a note under "The efficiency" and it is defined as "Definitions." It says that "Since the apparent efficiency of apparatus delivering electric power depends upon the power factor of the load, the apparent efficiency, unless otherwise specified, should be referred to a load power factor of unity."

Q. Now, let me call your attention—

A. That is referring to efficiency you understand, and not to power. That is referring to efficiency.

Q. What is the difference between power and efficiency, Mr. Thane?

A. Altogether different things. Efficiency means that percentage towards perfection so to speak; hasn't got anything to do with the power. The meaning of power—

Q. Are you familiar with Mr. Foster's book, Mr. Thane? A. I have seen it.

Q. You regard that as good authority, do you not?

A. It is a handbook.

Q. Now, I call your attention to the part that is marked here on page 507 and ask you to read that.

A. That is repetition, apparently the same thing. You see these handbooks are sort of little short state-

(Testimony of B. L. Thane.)

ments of directions for electricians to stick in their pocket [140—71] and run around with for practical purposes; not real discussions of the subject at all.

Q. Mr. Thane, if you will examine this book a little more closely you will find that what you have been reading from are the standardized rules adopted by the American Institute of Electrical Engineers.

A. Yes, it is.

Q. And merely stated in Mr. Foster's book. You see that there, Mr. Thane? A. Yes.

Q. That statement—the rules that I call your attention to are the rules adopted by the Institute of American Engineers, are they not?

A. Yes, I think so.

Q. It is, and that is pretty good authority, is it not, Mr. Thane?

A. Yes. This is the same as the other; it says since the apparent efficiency of that line—we are not discussing the efficiency, when we are speaking of what the power factor is—this is the efficiency of the apparatus, for instance, a machine may have an efficiency of 70 per cent or 80 per cent, that doesn't—has no relation to power factor.

Q. I know, but read that whole paragraph.

A. "Since the apparent efficiency of apparatus delivering electric power depends upon the power factor of the load, the apparent efficiency, unless otherwise specified, should be referred to a load power factor of unity."

Q. "Load power factor of unity" should be re-

(Testimony of B. L. Thane.)

ferred to—isn't that what it says?

A. Yes. [140½—72]

Q. Now, I will call your attention, Mr. Thane, to one of the other rules adopted by the American Institute of Engineers as those rules are reported in this handbook—not under the head of Efficiency, but under another head. I call your attention to rule 74 there. Will you please read that out and see what it says. Read it out, Mr. Thane.

A. All right. "Alternating current apparatus should be rated in kilowatts, at 100 per cent power factor; i. e., with current in phase with terminal voltage, unless a phase displacement is inherent in the apparatus, or is specified." Well, now when your power factor is below unity why there is a phase displacement.

Q. Exactly.

A. "If a power factor other than 100 per cent is specified, the rating should be expressed in kilovolt-amperes and power factor at rated load." Well, that is correct, it is all right.

Q. If a power factor then, Mr. Thane, you agree with this statement, that the power factor is not specified the apparatus should be rated at 100 per cent power factor? A. Unless—

Q. Unless what? What is the other?

A. Unless there is a displacement due to the phase which is due to the power factor, unless that factor exists in the system and it does exist in the system when you have a power factor less than unity.

Q. What is a phase displacement?

(Testimony of B. L. Thane.)

A. Well, that is this lag which occurs, that is all.

Q. That doesn't mean power factor?

A. That is the cause of power factor. The lag, that is what causes the condition of power factor.

[141—73]

Q. You know there is no such thing as a phase displacement over there at Sheep Creek, don't you?

A. Well, I know there is a lag in the alternations which causes this power factor. There is in their system and there is in ours.

Q. That isn't the phase displacement, is it?

A. Yes, it is the phase displacement.

Q. Now, Mr. Thane, to go back to power factors—is it not a fact that what the power factor—we will direct it to this specified case down there at Sheep Creek because I think it will result in less confusion than to cover more territory. Is it not a fact that the power factor that exists in the Sheep Creek line, in your Sheep Creek line I mean, depends upon the use to which the power is applied by you?

A. Yes.

Q. That is true, is it not? A. That is true.

Q. If you applied it to one use the power factor would be a given power factor? A. That is right.

Q. If you applied to another use the power factor would be something different?

A. When you speak of use you mean what type of machines that we are using on the line and how many of them?

Q. Yes, the various kinds.

A. Motors—different kinds of motors?

(Testimony of B. L. Thane.)

Q. Exactly.

A. So that affects the power factor?

Q. The power factor is even so variable that it is not the same one day and another in the same machine, [142—74] is that not true?

A. It would change according to the load that you were using on that machine.

Q. Exactly. Your 200 horse-power motor?

A. Yes.

Q. Would have a power factor one day of—a given power factor and the next day it might have a slightly different power factor? A. That is true.

Q. And another day still another power factor?

A. Yes.

Q. And the next day still a different power factor, depending upon the use you made of the power, is that not true?

A. That is true, but that would not affect the power.

Q. Wait a minute, I am talking about the power factor now. Then the power factor again depends upon the type of machine that may be used?

A. Yes.

Q. Upon the place at which it is used, is that not true?

A. Why, I don't think the place has any particular difference.

Q. That would affect the line loss probably more than the power factor? A. Yes.

Q. In some places, that is to say, the power could be placed to such use that the power factor would be

(Testimony of B. L. Thane.)

unity? A. It could, yes.

Q. And again it might be placed to such use that the power factor would be very low, is that not true?

A. Yes, 60 per cent.

Q. 60—50 per cent?

A. Well, I don't know of any place like that, but I presume that could happen. [143—75]

Q. All these things as to what the power factor is at any given time depends entirely upon the use which you make of the power and is entirely beyond the control of the defendant companies, is that not true? A. No, that is not.

Q. What control have they over the use that you are to make of the power?

A. Well, for example, they might—they might put in a synchronous motor in their power-house and float it on our line and by the use of that regulate the power factor at such a point as they would like.

Q. Well, there is no way in which the defendant companies have anything to do with the lack of machinery that you are using, have they, Mr. Thane?

A. No.

Q. Or with the load that you place upon your motors? A. Up to 300 horse-power, no.

Q. Or with the place where you use your motors?

A. No.

Q. They could not—it is none of their concern whether you use a synchronous motor? A. No.

Q. Or whether you use an inductive motor?

A. No.

Q. Or whether you use the power for electric light-

(Testimony of B. L. Thane.)

ing purposes? A. No.

Q. That doesn't—

A. They might if we used a synchronous motor, it would help their generator—they might have something that they would like. [144—76]

Q. They might like it, but they couldn't compel you to do it, could they, Mr. Thane? A. No.

Q. You actually do use some of this power for lighting purposes? A. Yes, use it sometimes.

Q. Use some of it for lighting purposes?

A. Yes.

Q. To the extent of what you use for lighting purposes you get 100 per cent power factor?

A. It is the average power factor that shows up in a line due to all the loads on a line.

Q. To the extent of what you use for lighting purposes you get 100 per cent power factor?

A. If that were alone, would get 100 per cent.

Q. To the extent you use your form K motors in the Perseverance the power factor is less than 100 per cent? A. No.

Q. Do you know what it is?

A. I think it is about 72 or 73 per cent considering all the loads that we have on the line, that is the motors and the lights and the transformers, you see.

Q. It varies so you can't tell just what it is from day to day?

A. You see, even a transformer will affect the power factor unless loaded up to full capacity.

Q. You have two transformers, have you not, on that line? A. Yes.

(Testimony of B. L. Thane.)

Q. In transmitting the power from Sheep Creek to the Perseverance you have first your line losses, do you not, Mr. Thane?

A. Yes, that is our loss. [145—77]

Q. That is your loss. You calculate that is your loss?

A. Certainly, you only deliver us so much power and all we get up above would be what we get plus the line losses.

Q. You also have your transformer losses, have you not? A. Yes.

Q. How much are those line losses and transformer losses?

A. Well, I don't know just—I would have to refer to the records to see just what they were.

Q. You wouldn't be able to tell?

A. Not offhand. They are not unusual. They are the ordinary line losses and transformer losses. We have standard equipment for that purpose.

Q. Yes. Now, if the power—if the power factor were regarded as unity you would be getting 100 horse-power at the Sheep Creek bus-bars at the present time, assuming it to be unity?

A. Assuming it to be; yes.

Q. That is correct? A. Yes; very close to it.

Q. That is within so little that it wouldn't make any difference? A. Yes.

The COURT.—Being at 100?

Q. (By Mr. J. HELLENTHAL.) 300?

A. 300.

Q. I mean 300.

(Testimony of B. L. Thane.)

A. We are not actually using that, but we could, assuming the power factor was unity with 56 amperes, we could use 300 horse-power. [146—78]

Q. The reason the power factor is not unity is because you are applying the power to some use that produces a lower power factor, is that not true?

A. Yes, just ordinary mining uses.

Q. Ordinary mining uses? A. That is right.

Q. Now, and the question of what those uses shall be is entirely beyond the control of the defendants, that is in your power exclusively?

A. Yes, just ordinary mining uses.

Q. Now, Mr. Thane, let's get down to the wattmeter. You said something this morning about the proper measure or measuring of the electric current. In your judgment you said, I think, if I understood you right, I might be mistaken, you thought the defendant companies should, instead of installing a circuit-breaker that goes out when more than 56 amperes passes through the line, over the line, should install a wattmeter?

A. No; that is not what I said, at least I didn't mean to say that. What I said was that our power should have *to measured* by a wattmeter and for ordinary practical purposes right alongside of the wattmeter would be an ammeter. Now, when that wattmeter read 220 kilowatts, which is equivalent to 300 horse-power, or practically so, the ammeter would show for practical purposes a certain number of amperes at that instant.

Q. Yes.

(Testimony of B. L. Thane.)

A. You take that number of amperes, as shown on that ammeter, and use that in your circuit-breaker, but you would not figure it at 56. It wouldn't be 56 either. Couldn't be 56. [147—63]

Q. Your wattmeter would take into consideration your power factor?

A. No. All the wattmeter measures is the exact power which we would get absolutely—the exact power which we get.

Q. Takes into consideration the power factor, is that not true? A. Yes, that is right.

Q. Assuming the power factor to be unity, it would not measure the power?

A. Oh, yes, it would. Doesn't make any difference what your power factor is, your wattmeter measures your exact power you are delivering on that line—the exact power.

Q. Now listen, the wattmeter measures the power you get in kilowatts?

A. Yes, the same as horse-power.

Q. And takes into consideration the power factor?

A. Yes.

Q. Now, if you were using your entire 300 horse-power places at your disposal and furnished you for lighting purposes, the wattmeter would indicate that you were using the equivalent of 56 amperes?

A. No, what would happen: your wattmeter would show 224 kilowatts, at the same time your ammeter showed 56 amperes.

Q. Your wattmeter would show 220 kilowatts and your ammeter would show 56 amperes, is that right?

(Testimony of B. L. Thane.)

A. That is correct.

Q. Well then, when you changed your use from electric lighting to a synchronous motor your wattmeter would still continue to show 220 kilowatts and your ammeter would continue to show 56 amperes, is that right?

A. If you had a synchronous motor on the line which would— [148—80] if you had it so arranged that the synchronous motor would bring up the power factor to unity.

Q. Yes, exactly.

A. If you—if that is possible to bring the power factor to unity.

Q. Bring it very approximately, Mr. Thane?

A. Yes, approximately, yes.

Q. Well, when you did away with the synchronous and installed a form K inductive motor—

A. Yes.

Q. Then your wattmeter would show 220 horsepower? A. Yes.

Q. Your ammeter would show what?

Q. (By Mr. SHACKLEFORD.) Show 224 kilowatts?

Q. (By Mr. J. HELLENTHAL.) 224 kilowatts. Your ammeter would show what?

A. The ammeter—I don't know exactly what it would show, but assuming 70 per cent power factor probably would show between 70 and 80 amperes.

Q. Between 70 and 80 amperes?

A. Yes, somewhere along there.

Q. Then—

(Testimony of B. L. Thane.)

A. But your wattmeter would only be showing 224 kilowatts, which is 300 horse-power, that is all it would show.

Q. Exactly, but the ammeter would show 70 or 80 amperes? A. Yes.

Q. Now— A. Somewhere along there.

Q. Then if you changed your use from the form K motor to some other form of motor that had—where the power factor would be greater— [149—81] A. Yes.

Q. The ammeter—the wattmeter would still continue to show the 224 horse-power?

A. Yes, that is correct.

Q. The ammeter would show something less in amperes than what it showed on the former occasion, would it not?

A. It would depend upon the power factor. If the power factor changed any it would.

Q. The actual amount, not of power, now, but the actual amount of the electric current—I want to get this thing so as to agree with you on this point—the actual amount of electric current furnished in the case of a lighting plant or the synchronous motor would be 56 amperes at a voltage of 2300, is that right? A. I think that is correct, yes.

Q. The actual—

A. That is if your synchronous motor was arranged so that it would bring your power factor up to unity.

Q. Exactly, but this unity—the actual amount of electric current used in the case of a form K motor,

(Testimony of B. L. Thane.)

assuming it to be about 80 per cent power factor, so that you say it would come up to about 80 amperes, wouldn't it, Mr. Thane?

A. I think that is about what it would be, somewhere along there.

Q. Would then be approximately 80 amperes with a voltage of 2300, would it not? A. Of that motor?

Q. Yes.

A. No, not necessarily. You see the power factor is a condition that exists all through your line. It is not [150—82] caused just by one special machine unless that was the only thing that was on your line. For instance, your transformers would affect it somewhat and even the line has a very slight effect on them.

Q. I know, but eliminating those matters and speaking only of power factors,—the flow of current would be affected to a certain extent—would be enlarged to a certain extent, that you would probably be getting 80 amperes instead of 56 at the same voltage of 2300?

A. Yes; that is just exactly the reason you can't use an ammeter to measure power with. Just exactly the reason. That is why you have to use a wattmeter.

Q. You are given an increased flow of current?

A. But no more power.

Q. You are getting an increased flow of current?

A. But no more power. You wouldn't get any more amperage.

Q. Get more amperage and no more voltage, is

(Testimony of B. L. Thane.)

that not true? A. No.

Q. The voltage remains the same?

A. The voltage remains the same.

Q. And you would get an increased flow of current, that is true, is it not?

A. More current comes in over, but no more power.

Q. Now your wattmeter doesn't measure the amount of power taken at any time?

A. Yes; it does.

Q. Listen now until I get through, then I think you will agree with me—but measures the amount of power per kilowatt hour, does it not, Mr. Thane?

A. No; that is the way it is ordinarily. It depends on the wattmeter, but an ordinary wattmeter measures the power at any instant. [151—83]

Q. You can go up and see the peak?

A. At any fraction of time.

Q. But doesn't prevent their overdrawing?

A. No.

Q. For instance, if the defendant companies were to install a wattmeter at Sheep Creek there would be nothing to prevent you from drawing 600 horsepower? A. Oh, yes, there would.

Q. What would it be?

A. I just told you a moment ago right along side of your wattmeter—

Q. (By the COURT.) You mean to assume there was nothing on there but the wattmeter?

Q. (By Mr. J. HELLENTHAL.) Assuming that the wattmeter is the only thing to break the current, the wattmeter wouldn't break the current?

(Testimony of B. L. Thane.)

A. No; the wattmeter would not break the current.

Q. There is nothing to prevent your taking 600 horse-power?

A. If you had no other instrument but the wattmeter.

Q. If you had no other instrument but the wattmeter, the best you could do would be to get a curve-meter to show the power had been taken?

A. You could use a curve-meter to show it.

Q. You could use, for instance, during this morning, this hour, for instance, you would use 100 horse-power, the next hour 300 horse-power, the next hour 600 horse-power, and the wattmeter would merely show the average of the power that you had used?

A. No, it wouldn't show the average. Show all that you used, not the average. Show what was used. [152—84]

Q. It would show you had used so many kilowatts during those hours, would it not?

A. No, if you looked at the recording apparatus you would see from the curves as it appeared on that just what you had drawn at any instant.

Q. I understand, but getting away from the curve reading wattmeter, an ordinary wattmeter wouldn't show you anything of that kind?

A. But it would show you what they are using at any instant.

Q. But it would show in the allowed time that you examined the wattmeter. You can't always stand and look at the meter, can you Mr. Thane?

A. No, can't always stand there.

(Testimony of B. L. Thane.)

Q. When you examined the wattmeter would only show that part of the actual number of kilowatts taken between the time of the two readings, is that not true? A. An ordinary wattmeter?

Q. Yes.

A. No; an ordinary wattmeter doesn't record—if you set an intergrading wattmeter that would record the power you had used from time to time and you could look at it and it would tell you where more than the peak had been used.

Q. When you use a curve line wattmeter the curve reading shows how big a peak above a certain fixed line had been used at any one time and how much below it? A. Yes.

Q. But there is nothing there to prevent the consumers from going above it?

A. Not in just the wattmeter.

Q. Now the only method, therefore, is by installing a circuit-breaker, is that not true? [153—85]

A. Quite right.

Q. Now, in starting machinery, Mr. Thane, what you choose to call a starting surge and we call a starting current is an increased flow of amperage?

A. Yes.

Q. At the same voltage, assuming the voltage to remain the same?

A. Well, the only reason your voltage is the same is because you have a Terro regulator on your machine which keeps the voltage up; otherwise the voltage would drop down so the multiplication by the two times the power factor would give you what

(Testimony of B. L. Thane.)

actual power you used at that instant.

Q. I know, but it requires more power to start a machine than it does to keep it running?

A. Instantly just to start it.

Q. For the start, for the time being, whether for one minute or for one second, or for whatever it is, it requires a large quantity of power to start machinery, does it not?

A. Yes, it wouldn't make—for instance, if you were looking at the indicators, that would go up like that, but as a matter of fact that actual power wouldn't be used for the reason that the indicator has an impetus from the sudden rush of current, the flip of current over it. If you took the top notch that might apparently seem as though you used a whole lot of power to start it, but the best way to show that you are not using a whole lot of power is that you could use a 300 horse-power generator by itself alone which would start it or be able itself at any time to start our—

Q. Now, but you don't want to deny you require an excess of power to start the machinery for a moment? [154—86]

A. Just for an instant.

Q. For a short time?

A. Just for an instant.

Q. If your machinery consumes 300 horse-power, it requires more than 300 horse-power to start it, does it not Mr. Thane?

A. No, it does not.

Q. It does not?

A. No, you can start it with 300 horse-power.

(Testimony of B. L. Thane.)

Q. Then it does not require, Mr. Thane, any more horse-power to start machinery than it does to keep it running?

A. No, you see the way you start it, you always start it without the load and you start slowly. For instance, you take an ordinary engine of 300 horse-power it certainly will start the machinery that it runs. Take a sawmill with a 300 horse-power engine where it requires 300 horse-power to do the sawing, it will start the machinery and run it, start the line first.

Q. You know, Mr. Thane, the resistance offered by machinery standing still? A. Yes.

Q. It is very great and requires momentarily a tremendous amount of power, you know that as an engineer?

A. Yes, but here are the conditions, you don't start these motors on that line against the full load. You always take the load off. What actually occurs the motor is running a compressor, the compressor is then loaded. In our case the compressor was unloaded, not pressure against it at all. All in the world that motor has to do is to turn itself, start itself and start that compressor, just turning over, that is all. [155—87]

Q. Now, you wish now to testify, Mr. Thane, that if you got 300 horse-power at Sheep Creek—

A. Yes.

Q. —you could operate your machinery and start your machinery required, with 300 horse-power?

A. If I had an independent plant and no other

(Testimony of B. L. Thane.)

uses, you understand, at all; an independent generator of 300 horse-power with a pipe-line, for instance, that went against the water-wheel, that ran that generator, and a pipe-line designed to carry no more than 300 horse-power, that would start all our machinery and run it up to 300 horse-power.

Q. If a power plant were especially installed for your use you mean?

A. That is just an illustration, yes.

Q. But I am talking about the power plant as it exists, not one especially installed for your use, but a large power plant from which you were drawing—

A. Yes.

Q. Say you have 300 horse-power furnished you at the power plant for use in operating machinery, can you start your machinery without drawing from the power plant an excess of load, a larger quantity of horse-power than 300 horse-power, that is what I mean?

A. I think we could, Mr. Hellenthal, providing we went to work and put in a lot of special apparatus for that purpose.

Q. Special apparatus for that purpose?

A. Special apparatus for that purpose, above the ordinary.

Q. And that apparatus is obtainable and you could put that there if you wished to?

A. I think we could, yes. Have to put in special apparatus. [156—88]

Q. You have not that apparatus now, Mr. Thane?

A. We have no special apparatus. Just have the

(Testimony of B. L. Thane.)

ordinary practice.

Q. The ordinary machinery such as others are using?

A. Such as they use at Treadwell exactly.

Q. Just as they are using at Treadwell?

A. The same types.

Q. With the machinery you now have installed in order to start out, hook on the 300 horse-power, do you require more than 300 horse-power to start with?

A. I suppose for an instant we do. I don't know just what it would figure. It would be so instantaneous, I don't know as you could figure that exactly. I personally don't think it takes 300 horse-power to start that. Think it is just the sudden rush of current is my own opinion.

Q. It has the effect, however, of throwing out that circuit-breaker?

A. Yes, because the circuit-breaker is set at unity power factor with 56 amperes, just registers current, not horse-power, and just the second that current rushes through there quicker than that (indicating), out it goes before you can get a start; but I don't believe personally that the actual power it takes to turn over that machinery is 300 horse-power if you could get right down and measure it. It would be difficult to measure it with that ammeter and wattmeter for the instant that they start that swings the current over and back under, quick as lightning. Might probably run over the 300, but I don't think that it does personally.

Q. You would not then be complaining then, Mr.

(Testimony of B. L. Thane.)

Thane,—you don't want any more than that? [157—89]

A. We don't want any more than 300 horse-power and a chance to start our machinery.

Q. When you say a chance to start your machinery?

A. All we want is a chance to start our machinery.

Q. When you say a chance to start your machinery, do you mean more than 300 horse-power?

A. Just enough to start our machinery, whatever it is.

Q. If it takes more than 300 horse-power, is that what you mean to say?

A. Yes, we want to start our 200 horse-power motor. It is only 200.

Q. I understand, yes, but we are figuring now on the basis of 300. A. Yes, I see.

Q. If it requires more than 300 horse-power to start your machinery, you are figuring you ought to have it?

A. Yes, under the contract ought to be given a chance to start our ordinary machinery.

Q. In the case of the construction of an electrical contract, Mr. Thane, that specifically reads "An electric current not to exceed 300 horse-power," you think that you would be entitled to more than 300 horse-power?

A. You don't want—you forget it is not interrupted.

Q. When the contract expressly says "An electrical current not to exceed 300 horse-power," I am as-

(Testimony of B. L. Thane.)

suming such a contract to exist. A. Yes.

Q. Do you still, notwithstanding the wording of that contract, as an electrical engineer, say that the consumer would be entitled to more than 300 horse-power at any time? A. Yes, sir. [158—90]

Mr. SHACKLEFORD.—Just a moment. I don't know just how far the Court wants to go into this. It seems to me that Mr. Hellenthal is commencing to argue his case now instead of cross-examining the witness. There is no question about what their claim is. It is contained in the complaint. We claim a reasonable starting surge.

The COURT.—I think the witness is being used as an expert in electricity and on that standpoint I think the question is reasonable.

Mr. SHACKLEFORD.—Very well.

A. (By the WITNESS.) Repeat your question, please.

Q. (By Mr. J. HELLENTHAL.) Where a contract, an electric contract, expressly provides, Mr. Thane, for the furnishing of an electrical current not to exceed 300 horse-power, under such a contract you wouldn't say that the consumer would be entitled at any time to a current larger than 300 horse-power, provided, of course, Mr. Thane, that there were no other specifications in the contract?

Mr. SHACKLEFORD.—Just a moment. We object to that question as not based on any hypothesis in the case. No objection to the questions being asked with reference to the contract and its provisions being shown to the witness.

(Testimony of B. L. Thane.)

The COURT.—Objection overruled.

A. (By the WITNESS.) May I answer the question?

The COURT.—If you understand it.

A. Whenever on all the technical points of an electrical contract, as might be defined by an electrician, —where mistakes in a contract I would look to the intent of the party who made the contract and see what they meant when they made the contract. [159—91]

Q. (By Mr. J. HELLENTHAL.) Well now, Mr. Thane, leaving the intent of the parties out, supposing you know nothing of the intent of the parties, you are only judging from the contract, pay no attention to what the parties intended, that is still another matter, would you if the contract expressly provides upon its face for the furnishing to a consumer of an electric current not to exceed 300 horse-power, makes no other provision with reference to the furnishing of the power and you had nothing before you as to the intent of the parties outside of the provisions in the contract, you don't know what the parties talked about before the contract was entered into, on such a contract you wouldn't claim that the consumer would be entitled to more than 300 horse-power at any one time, would you Mr. Thane? A. No.

Mr. J. HELLENTHAL.—That is all.

Redirect Examination.

Q. (By Mr. SHACKLEFORD.) Now then, Mr. Thane, starting on that line of assumption, I will ask you this question. If a contract designed to give to

(Testimony of B. L. Thane.)

the use of a party 300 horse-power was before you, what would you say with reference to the fair and usual and proper practice with reference to a starting surge?

A. I would say that it is proper to give them an opportunity to use that 300 horse-power.

Q. Well, if under the conditions established at the generating plant you were compelled to use a starting surge, your answer would be that you are entitled to that starting [160—92] surge?

A. Certainly would be.

Q. If that condition of affairs which denies to you an uninterrupted current exists at the generating plant where the contract provides for an uninterrupted current, what would you say as to the use of a reasonable starting surge?

A. I would say they would have to give it and have to put in a time relay so you could have it.

Q. Without a number of special devices, Mr. Thane, it would be impossible to get the benefit or the use of the 300 horse-power with the conditions in the generating plant of the defendants, wouldn't it?

A. That is correct.

Q. Now, for example, for illustration, I will ask you the question which was asked Mr. Kinzie the other night, when Sheep Creek gets to a stage of water where it is impossible to create more than 300 horse-power on its generators and yet it is possible to create an even 300 horse-power, what condition are you in with reference to starting?

A. They can start us, absolutely without question.

(Testimony of B. L. Thane.)

Q. If the defendants in that case were enabled to arrange in any way, either by separate generator, water-wheel, or in any other way, an uninterrupted current of 300 horse-power, what would be your condition with reference to starting?

A. They could start us.

Q. Now, in the beginning of the examination Mr. Hellenthal has referred to the question of time relay circuit-breakers, and I will ask you where the ordinary circuit-breaker is set without a time relay on it, what arrangement [161—93] is made with reference to that circuit-breaker so that it performs the same functions as a time relay circuit-breaker?

A. Well, for instance if you are running a motor off a main line or distributing line, it is very often the practice, instead of putting in a time relay circuit-breaker, to put an instantaneous circuit-breaker in there; but you set the amperage of that circuit-breaker so that it will allow for the surge in starting, that is all; in other words the amperage is set much higher than the machine actually uses so that it can start and run, that is for individual motors or two or three motors on the line.

Q. Now the particular circuit-breaker used in this case is not only instantaneous, as I understand it, but it is set to the hair on the amperage calculated by the defendant companies?

A. Yes, figured at unity power factor.

Q. I will ask you what the general use of synchronous motors is at the present time with reference to generating plants. Just explain to the Judge

(Testimony of B. L. Thane.)

how it is used and whether the generating plant or the consuming plant is in the habit of placing a synchronous motor there?

A. Your Honor, a synchronous motor just developed in the last two or three years past, has come into use almost entirely in places where the man who is generating or the company who is generating power had a system already installed and where their generator for making the current had become overloaded with current and they wanted to get more use out of its generator. They very often take and bring a synchronous motor, as they call it, float it in on the line even though it isn't running anything, sometimes [162—94] with the idea of bringing the power factor up to unity so that the generator will have greater capacity and then they can put more power on the generator and get more power out of the same machine, that is all.

Q. Now, can such an apparatus for the purpose of synchronizing be established at the Sheep Creek power plant? A. Yes, it could.

Q. Now, there is another question, Mr. Hellenthal has showed you a number of books herewith *refer* to the rating or efficiency of machines and the power factor and to clauses referring to machines that are not rated? A. Yes.

Q. I will ask you if you know what the rating on the generators of the defendant companies is at Sheep Creek?

A. I have been informed from Mr. Pullen and Mr.

(Testimony of B. L. Thane.)

Wallenburg. I never examined them personally, but they both—

Mr. J. HELLENTHAL.—Object to that testimony.

Q. (By Mr. SHACKLEFORD.) Well, if the rating on those generators was 85 per cent and the rating on your motor was 85 per cent at the Perseverance mine would you under that rule have any right to use unity power factor?

A. Why, I don't know. Their generator is figured, I think, at 85 per cent power factor because that is the motor rating of the machines recognized in power factor and the natural conditions of the inductive loads of the machine was designed with 85 per cent power factor, I think it is 85 per cent, that that is the usual rating for all those generators.

Q. But what I mean to say is—the questions by Mr. Hellenthal directed to you were upon a state of facts referring [163—95] to the efficiency of machines that were unrated?

A. Exactly; special conditions.

Q. How many synchronous motors—do you know of any synchronous motors in use in this mining district at the present time?

A. I think, I don't think there are any actually in use.

Q. I understand, Mr. Thane, that your current and machinery in connection therewith are being used in ordinary mining operations?

A. They are.

Mr. SHACKLEFORD.—That is all.

(Testimony of B. L. Thane.)

Recross-examination.

Q. (By Mr. J. HELLENTHAL.) Just a question or two, Mr. Thane. What do you mean by saying that the generator has an 85 per cent power factor?

A. Why, I mean this, that—I have already stated the same thing two or three times—when you say 85 per cent power factor for the generator, their generator is designed so that it won't overheat with a certain generation of current and power and the designer of the machine recognizing ordinary practice and custom has figured on an induction loan of 85 per cent, figuring that is the average induction loan or somewhere near it that would take place.

Q. Take a particular plant to carry, is that what you mean?

A. Could carry that without overheating.

Q. Without overheating. You don't mean to say that a particular plant, the generator plant generates power factors? A. No.

Q. It generates amperes and voltage? [164—96]

A. Generates current.

Q. Amperage and voltage, is that not true?

A. It is built to have a certain power factor.

Q. But it has nothing to do with the amperage and voltage generated, does it? A. Yes.

Q. How does what you call the power factor of the generating plant enter into the power actually existing in the amperage and voltage generated at the generator has nothing to do with it?

A. Yes, affects the capacity of the machine.

Q. Affects the capacity of the machine, but it

(Testimony of B. L. Thane.)

doesn't affect the power, the horse-power actually existing in the amperage and voltage generated, does it? A. Your question doesn't cover it.

Q. Well, answer my question.

A. I am going to try to answer the question.

Q. All right.

A. The voltage of the machine is kept standard or nearly so, so the amperage, meaning the measure of current, would vary and if you had your machine built so—had it built at 85 per cent power factor it would mean that that machine before it overheats would develop so many amperes of current and if you brought that up to unity power factor it would develop still more amperes of current under the same voltage without overheating, provided you put more power on it.

Q. That is the point exactly.

A. It affects it though.

Q. By the power factor of the generator you mean the difference between the commercial capacity given to a power [165—97] plant and the power—than what you actually produced without overheating?

A. No; I mean the current that it would be capable of producing under ordinary loads without overheating, that is what it is designed for.

Q. With relation to the commercial given capacity of the generator?

A. Well, the actual capacity, not the commercial; the actual capacity of the generator.

Q. Now listen, Mr. Thane, the power plant at Sheep Creek, we will say, is rated at a 3,000 horse-

(Testimony of B. L. Thane.)

power plant? A. Yes.

Q. It actually generates something less than that?

A. Yes.

Q. That is true, isn't it? A. Yes.

Q. But what it does generate, the horse-power it generates is horse-power just the same, isn't it?

A. Oh, of course.

Q. Why certainly, the voltage and the amperage generated at the generating plant have in them no element of power factor? A. Oh, yes, they have.

Q. Why?

A. Because the power factor of the circuit drawing the power off of this machine would have a certain power factor which affects the generator. The generator is a part of the system; bound to be affected by it.

Q. I know, but listen now to this question so you understand me, Mr. Thane—I don't think you quite understand me. When a certain amperage impressed with a certain [166—98] voltage passes from the bus-bars upon a wire, upon a system to carry it away somewhere for use, the amperage and voltage taken from the bus-bars represent so many watts being the sum of the two or the product of the two and that is not affected in any wise with the generating capacity of the generating plant, is it?

A. Well, that multiplication you use left out the power factor.

Q. Well, putting in the power factor—the power factor—I am speaking not now of power factor or generator, but the power factor of the motor?

(Testimony of B. L. Thane.)

A. Yes, it would affect the generator—the generator when figured at 85 per cent.

Q. I am not saying whether it would affect the generator. Would the power factor of the generator affect the current itself except to increase or diminish it?

A. Well that affects it. It would in that respect.

Q. Well, it wouldn't affect the horse-power in a given current? A. Yes, it would.

Q. Now, we are taking this case, Mr. Thane—let's see if we understand one another—where we have a generating plant, we will say, of—with a power factor of 85 per cent beside it—a generator with a power factor of 78 per cent as of those—

Mr. SHACKLEFORD.—Generating plants?

Q. (By Mr. J. HELLENTHAL.) Well, generating power. A. Yes.

Q. We draw from one generating plant or we draw from each generating plant at a voltage we will say of 2,500 or whatever it is, 2,000, the amperage and voltage drawn in [167—99] each instance being the same, you see—now, the power factors of the generating plants being different, you understand now, is it not a fact that the current drawn from one generating plant has exactly the same horse-power that the current drawn from the other generating plant has? A. That the current—

Q. Yes. A. Your terms are a little confused.

Q. Let's get it straight so we will understand it; that is the easiest way to get it you understand. You assume here a generating plant that has what we call

(Testimony of B. L. Thane.)

a power factor of 85 per cent and right immediately beside it is a generating plant with a power factor of 75 per cent you see? A. Yes.

Q. The power factors in the two generating plants being different. Now both of these generating plants are working— A. Yes.

Q. We draw from the bus-bars of the two plants two currents, one from each plant, the current drawn from each plant has a flow of 100 amperes impressed with a voltage of 2,000, you see? A. Yes.

Q. The amperes and voltage in each case being the same you see? A. Yes.

Q. Is it not a fact that the horse-power contained in each one of these two currents is exactly the same?

A. No; it would depend upon the power factor.
[168—100]

Q. The power factor in the generating plant?

A. Well, yes, so long as your generator is in your system.

Q. Wait a minute; let me understand.

A. I think I do understand.

Q. The power factor in each one of these cases is the same, you understand, the power factor of the motors?

A. I think I understand what you are driving at with your questions.

Q. All right; now answer.

A. Well, you are trying to see, aren't you, what the effect of this 85 per cent power factor that is rated on the machine has to do with the whole system?

Q. No.

(Testimony of B. L. Thane.)

A. Isn't that what you were trying to show?

Q. No. That ain't what I am trying to show. I am trying to show what that effect of 85 per cent power factor of the generator has to do with the current actually produced.

A. That is what I am talking about.

Q. If you— A. I understand.

Q. Is this not a fact, let's get at it this way—see if we understand one another—that the 85 per cent power factor in the generator deals entirely with the producing power of the generator, that is to say?

A. It is the rating that the generator has before it would commence to overheat.

Q. Yes, that is to say— A. And it is also—

Q. If more than 85 per cent of the produced power of the generator is produced, you say the generator is liable to overheat; isn't that what it means?
[169—101]

A. No; if the power factor would be less than that, why the capacity of the machine would not be quite so great, that is what it would mean. The fact of it being rated 85 per cent power factor, as a matter of fact, Mr. Hellenthal, is a recognition on the part of the makers of the power factor existing in the average load and they take one of 85 per cent and they build their machine so that it will be built expecting a power factor of that percentage, you see, that is why they do that. Now, if you changed your—if your system would change this power factor so it was 70 or 60 per cent instead of 85, your machine would not have quite the capacity that it would if your

(Testimony of B. L. Thane.)

whole power factor was 85 per cent. Do you see, they just assume that point of 85 as a sort of average and use that as a rating there at that point.

Q. If you get more then out of it you are apt to heat your machine?

A. No; if your power factor is less than that your machine would not have as great a capacity. At that point the machine has the normal capacity for which they built the machine for.

Q. That is to say, your machine is supposed to have the capacity indicated—multiplied by the horsepower?

A. To get the horse-power that the machine was designed for you would figure on a 85 per cent power factor in your line and it is a good example of the recognition on the part of the makers of the average load having a power factor.

Q. It has nothing to do with the fact that the generating plant would overheat if forced to generate its entire [170—102] capacity or anything of that kind?

A. Yes; it is the point at which the machine reaches the condition on which it was sold. It was sold not to overheat when there was 85 per cent power factor on the line and it is developing so many horsepower, that is what it is sold to you for and they rated it at 85 per cent power factor for that reason.

Q. Well now, that has to do entirely with the capacity of the generating plant, has it not, Mr. Thane?

A. Yes.

Q. And has nothing to do with the horse-power in-

(Testimony of B. L. Thane.)

herent in the amperage and voltage produced, does it? A. Well, it has, yes..

Q. A watt produced by one generating plant contains exactly the same power that a watt contains produced by another generating plant, regardless of what the power factor in the two plants may be, does it not? A. Yes.

Q. Is that not true?

A. Yes, provided you considered power factor that is true.

Q. A watt, that is the unit of electricity?

A. Yes.

Q. One watt contains exactly the same amount of power as another, does it not?

A. Yes, multiplied by its power factor under a given condition.

Q. Well, a watt is a watt, isn't it?

A. Yes, a watt is a watt.

Q. And doesn't one watt contain the same power factor that another does? A. No. [171—103]

Q. It doesn't? A. It doesn't.

Q. I say the same power factor. I don't mean that, Mr. Thane. I mean the same quantity of power as a unit of electricity? A. It does.

Q. Why, certainly, and that is so regardless of power factor that may exist in the generating plant that produces the watt; is that not true?

A. No, the power factor is a part of your watt. A watt is the same under all conditions, but if your power factor is different the amperage is different.

Q. But it requires a certain number of amperes to

(Testimony of B. L. Thane.)

make a watt? A. Multiplied by this power factor.

Q. Well, I understand, assuming the power factor of the motor to be unity? A. Yes.

Q. But the power factor of the generating plant, the power factors of the different generating plants would be different. If one generating plant has produced a watt— A. Yes.

Q. The generating plants having different power factors, the watts having—

A. Would be the same.

Q. —being used for the same purpose?

A. They would be the same.

Q. They would be the same and that is all there is about that subject. Now, Mr. Thane, there is another question I forgot to ask you about a little while ago. You don't intend to operate all these mines that you are talking [172—104] about with this 300 horse-power? A. No, sir.

Q. Never did so intend? A. No.

Q. You intended to have your Salmon Creek plant ready by November, didn't you?

A. Didn't think we could get it ready by November; in fact knew we couldn't.

Q. That was your original plans?

A. My original plan was to push it as hard as I could push it, and that is exactly what we are doing; working night and day right now.

Q. You expected to have it by November?

A. No, sir.

Q. When did you expect to have it ready?

A. Just as soon as it was finished. A good many

(Testimony of B. L. Thane.)

factors that come into those things.

Q. I am not finding fault with you for not having the Salmon Creek plant ready.

A. I wish it was ready just as much as you. I had counted on the 300 horse-power and need it too and I need the power and I counted on it all the way through.

Q. You continue to count on the 300 horse-power?

A. Yes, we do.

Q. Even if the Salmon Creek plant is ready?

A. If an opportunity to use it is given.

Q. When will your Salmon Creek plant be ready?

A. I can't say.

Q. Have you any idea?

A. I hope to get it ready in a month or six weeks.

Q. In a month or six weeks? [173—105]

A. If can get in that unit are going to do it.

Q. How much power will the Salmon Creek plant give you?

A. About five or six hundred horse-power.

Q. Five or six hundred horse-power?

Mr. SHACKLEFORD.—I don't know what the purpose of counsel is, but it seems to me that he has gone into it far enough so far as this case is concerned.

Mr. J. HELLENTHAL.—Merely to show that all these disastrous effects if they don't get their 300 horse-power will be overcome at the time the Salmon Creek power comes in.

Mr. SHACKLEFORD.—Not cross-examination.

The COURT.—Objection sustained. I think he

has already answered that question.

Mr. J. HELLENTHAL.—That is all.

Witness excused. [174—106]

[Testimony of W. S. Pullen, for Defendants.]

W. S. PULLEN, being called and duly sworn, testified as follows in behalf of the defendant:

Direct Examination.

Q. (By Mr. SHACKLEFORD.) Mr. Pullen, just state your name and occupation.

A. Name, Winfield S. Pullen; occupation, electrician; living in Juneau, Alaska.

Q. Mr. Pullen, have you been in charge of the—in active charge of the plant of the plaintiff company in this case and their lines?

A. Yes, sir, since June the eleventh.

Q. June the eleventh?

A. Yes, sir; construction and operating.

Q. You remember about what time you started to build the feeder line of the plaintiff company so as to make the connection between the Perseverance and the—

A. Sheep Creek end?

Q. —Sheep Creek end?

A. I think that was the latter part of July.

Q. You have been in the power-house of the defendant companies?

A. Yes, sir, several times.

Q. I will ask you to state, Mr. Pullen, what method of power measurements is used by the defendant companies upon their own lines exclusive of the line in controversy?

A. I think a wattmeter.

Mr. J. HELLENTHAL.—That is immaterial, your Honor.

(Testimony of W. S. Pullen.)

The COURT.—Objection overruled. [175—107]

Q. (By Mr. SHACKLEFORD.) What sort of meter is set upon the line of the plaintiff company?

A. They have simply an ammeter on the panel and an oiled switch—a circuit-breaker.

Q. Is that—

Q. (By the COURT.) What sort of switch?

A. This is a circuit-breaker—an oil switch.

Q. Oiled? A. Oiled switch and ammeter.

Q. (By Mr. SHACKLEFORD.) How does it operate, by time or instantaneous?

A. Well, it is supposed to operate and is operated instantaneously so far as we can judge.

Q. What sort of circuit-breaker is used by the defendant companies in connection on the lines feeding their own plant?

A. Well, they use an oiled switch connected with a relay circuit-breaker—in connection with a relay.

Q. How long, Mr. Pullen, have you been an electrician? A. About seventeen years.

Q. Seventeen years? A. Yes, sir.

Q. You were with the city lighting plant here before you— A. Yes, sir.

Q. —went with the plaintiff? A. Yes, sir.

Q. Assuming that there was given to us, that is to the plaintiff company, an uninterrupted current of three hundred horse-power, what would you say with reference to the starting capacity of such a current [176—108] upon the plant of the plaintiff company as it now exists at the Perseverance mine?

A. Well, I could run the plant easily—we could

(Testimony of W. S. Pullen.)

run a two hundred horse-power motor without any trouble.

Q. Assuming that the Sheep Creek power plant was reduced in its flow of water so it could only produce three hundred horse-power and no more, what would you say with reference to starting the machinery at the Perseverance mine?

A. We would not have any trouble.

Q. To what extent would you say you could start machinery, that is what the machinery in the Perseverance mine is—of about what horse-power?

A. Well, it is—it is built for one hundred and seventy-five to two hundred, depending on the line voltage—amperage on the motor.

Q. You would be able to start nearly three hundred—a machine of nearly three hundred horse-power—with the water in Sheep Creek producing only three hundred? A. We could, yes, sir.

Mr. J. HELLENTHAL.—Your Honor, that is immaterial; the water is not producing three hundred, it is very much less.

The COURT.—I don't think it makes any difference with this question, just showing the starting power of three hundred horse-power. [177—109]

Q. (By Mr. SHACKLEFORD.) Now, then, Mr. Pullen, under ordinary circumstances, with a circuit-breaker, an instantaneous circuit-breaker, with as is set by the defendant companies upon the line of the plaintiff company or with the power plant sometimes operating—with a power, frequently operating with a power above three hundred horse-power,—could

(Testimony of W. S. Pullen.)

you under those circumstances obtain the use or benefit of three hundred horse-power?

A. Well, the way the circuit-breaker is set now I could use our motor if they would allow us to start it up, but I can't start that motor with the circuit-breaker set at fifty-six amperes; that is impossible.

Q. It is impossible to get the benefit or enjoyment or the use of three hundred horse-power under those conditions? A. That is the idea.

Q. That is all. Just a moment—probably want to cross-examine you. O, yes, there is another question, Mr. Pullen. It has been stated in the courtroom several times to-day that when—I will withdraw that question—in the first place, what is the proper method of measuring horse-power?

A. By using a wattmeter.

Q. Do you know of any other recognized, of measuring actual power in delivery?

A. I do not; no, sir.

Q. With reference to starting this plant, will you [178—110] tell the Court first about the starting of this plant from the gas plant some days ago, the amount of power used and the result of that experiment?

A. Well, we have a gas engine, Judge, that drives a 200 kilowatt generator; the gas engine at best has never developed more than 225 horse-power, and we have been able to start this motor that is mentioned here that day with that machine without any trouble.

Q. How long were you able to run it?

A. Well, running under full load, run about an

(Testimony of W. S. Pullen.)

hour and a half when the engine wouldn't stand it and laid down.

Q. The gas engine wouldn't stand it?

A. The gas engine wouldn't stand it.

Q. Now, I will ask you what you have to say with reference to the claim that it takes 900 horse-power to start this Perseverance current?

A. Well, I know that is a mistake.

Q. —or machinery? A. Absolutely a mistake.

Q. I wish you would describe to the Court the approximate duration of this so-called starting surge?

A. Whenever we start the motor at the Perseverance, Judge, the needle on the—

Mr. J. HELLENTHAL.—Just a little louder.

A. —whenever we start this motor at the Perseverance the needle located on our ammeter 'located on our Sheep Creek board surges up to about one hundred and fifty and drops back to [179—111] normal inside of ten seconds. I have seen it start up at the Treadwell plant—I could start up on a gas engine in about twenty seconds on just about the same surge, as near as I could measure it.

Q. (By Mr. SHACKLEFORD.) Now, I wish you would tell a little more particularly how long that needle stands at the extreme limit and how the drop comes?

A. Well, in the first instance, it will surge up to a hundred and fifty, then inside of half a second she will drop back to about seventy-five, as near as you can judge, and then inside the next eleven or twelve seconds she will be back to normal, which in that case

(Testimony of W. S. Pullen.)

would be about thirty amperes, that accounts for the current since in the current the line losses also the transformer losses appear.

Q. (By the COURT.) You mean you get thirty out of fifty-six? A. Yes, sir.

Mr. SHACKLEFORD.—That is all. [180—112]

Cross-examination.

Q. (By Mr. J. HELLENTHAL.) How long, Mr. Pullen, did you say you had been engaged as electrical engineer?

A. I never said I was engaged as electrical engineer; I said I had been in the electrical business for seventeen years.

Q. You have had no special training as electrical engineer?

A. No, I have had ordinary school education. I am not a graduate of any college.

Q. You are not a graduate of any college?

A. I went but never graduated.

Q. Well, your experience is based merely upon your knowledge of electricity—is based merely upon your experience? A. Yes, sir.

Q. In working with electricity? A. Yes, sir.

Q. In various capacities? A. Yes, sir.

Q. As a line man and as— A. In all capacities.

Q. And as electrician in all capacities?

A. Yes, sir.

Q. And that experience covers a period of seventeen years? A. Yes, sir.

Q. Where has that experience been, Mr. Pullen?

A. Well, eight years in Juneau, and I was four

(Testimony of W. S. Pullen.)

years [181—113] in Boston.

Q. For eight years in Juneau you were connected with the electric light plant, in Juneau?

A. Yes, sir.

Q. What was the balance of it?

A. Four years' work in the city of Boston.

Q. What were you doing there?

A. I was electrician with a construction company handling everything from a push button to a complete heating, light and power-plant—general electrical contractors.

Q. You were with them for four years?

A. Yes, sir.

Q. What work—what special work did you do with them, Mr. Pullen?

A. Well, my specialty at that time was fireproof construction, that is, wiring and equipping fireproof—wiring and equipping fireproof stores, office buildings, anything.

Q. Wiring buildings so they would be fireproof?

A. Yes, sir.

Q. That was your business for four years when you were with the Boston concern? A. Yes, sir.

Q. What other experience have you had?

A. Well, I was with the J. N. V. Lane Construction Company, at Bangor, Maine, as construction foreman.

Q. How long with those people?

A. Nearly three years. [182—114]

Q. What was your specialty in connection with that employment?

(Testimony of W. S. Pullen.)

A. I had direct charge of all their out of town construction; they were general electrical contractors.

Q. What did you furnish—electric lights?

A. Yes, sir, anything electrical.

Q. The same as the Juneau electric lighting plant, on the same—

A. O, no, the Lane Company was a general contractor. He handled goods, anything in an electrical line throughout the country.

Q. Installation of electrical apparatus?

A. Yes, sir, that is the idea.

Q. You installed electric lighting plants and things of that kind? A. I did.

Q. You were with them for three years?

A. For nearly three years.

Q. Now, Mr. Pullen, your plant at the Perseverance operated successfully up to the twenty-fifth of December, did it not? A. Yes, sir.

Q. The circuit-breaker at Sheep Creek was then placed exactly as it is now, was it not?

A. No, sir, I understand not, otherwise never been able to start that motor.

Q. You understand. If it was standing on the twenty-fourth or the twentieth of December just as it now stands, you have been misinformed?

A. Yes, sir. [183—115]

Q. Is that true? A. Yes, sir.

Q. Now, about your starting surge, by a starting surge, Mr. Pullen, you mean an increased flow of electricity, isn't that it?

A. That is about the idea. Yes, that is all within a moment.

(Testimony of W. S. Pullen.)

Q. Sometimes called a peak?

A. Yes, sir, sometimes called a peak, most always called a surge though.

Q. You call a surge?

A. There is quite a difference between a surge and a peak.

Q. What is the difference between a surge and a peak?

A. Well, they usually speak of a peak as a peak load, that is the highest point or load in a power-house that would register during the day.

Q. That is the peak?

A. That is the average during twenty-four hours.

Q. That is the peak load for the twenty-four hours? A. Yes, sir.

Q. That is you say it is the highest amount of power drawn during the twenty-four hours?

A. That is the idea.

Q. The word "peak" originated with the curve reading meter? A. Highest point.

Q. So the curve reading meter showing the line up and down, wave up and down as the current is drawn?

A. Yes, sir. [184—116]

Q. The uppermost points are the peaks?

A. That is the idea.

Q. That is what you referred to as a peak, is it not?

A. Yes.

Q. That is you say the highest quantity?

A. The highest point would be the peak, yes.

Q. And what you draw when you start is an increased quantity of amperage and voltage?

(Testimony of W. S. Pullen.)

A. No, might be an increase in amperage for a short time but the voltage, unless it were artificially kept up, would drop.

Q. Well, where a voltage is constant, as it is at Sheep Creek, there would be an increase in amperage?

A. Yes, there would be for a short time.

Q. For a short time? A. Instantaneous.

Q. A machine that draws—that requires three hundred horse-power to operate when it is loaded would require for a short time when it is starting a quantity of power in excess of three hundred horse-power?

A. We haven't any machine that requires three hundred horse-power to operate.

Q. I know, but a machine that does—if you had such a machine—a machine that would require three hundred horse-power would require a peak to start it, would it not?

A. Yes, but a machine that would require a three hundred horse-power to operate don't necessarily mean that it would take that—three hundred horse-power to start it up. Always start it under no load [185—117] and light.

Q. Well, I am talking if you—of course, if you do not increase your—if you make your—take your load off your machine, why you don't require over the three hundred horse-power, if the machine is a three hundred horse-power, you would require no starting surge or peak?

A. Oh, yes; it takes a little surge. I could start up a machine that takes three hundred horse-power to

(Testimony of W. S. Pullen.)

operate with a fifty horse-power motor but I could not run that machine under load, that is, start it up light—no load on it.

Q. Then, if you were getting at Sheep Creek off the bus-bars there three hundred horse-power and your machines required three hundred horse-power to operate, you could start, couldn't you, Mr. Pullen?

A. Oh, yes; could start all right.

Q. And an instantaneous circuit-breaker would not interfere with your starting?

A. Well, if that circuit-breaker was set so we could start—if we can use the three hundred after we get up the speed.

Q. If the circuit-breaker permitted you to take no more than three hundred horse-power could you start?

A. Well, if I got, if we had a connection with that circuit-breaker, had a time relay which was set to allow for these little starting surges.

Q. I am speaking of an instantaneous circuit-breaker?

Mr. SHACKLEFORD.—If the Court please, I would like to [186—118] have the witness finish his answers to the questions.

Q. (By Mr. J. HELLENTHAL.) Where the circuit-breaker is instantaneous, Mr. Pullen, and is set at three hundred horse-power could you start the three hundred horse-power machine?

A. Yes, sir, we could.

Q. You could? A. We could.

Q. Nothing to interfere with your starting?

(Testimony of W. S. Pullen.)

A. We could start a three hundred horse-power machine with a fifty horse-power motor, that is running with no load, but we could not get that up to load.

Q. The only reason then, Mr. Pullen, you are not starting your machine, if you are getting your required horse-power, is because you are not taking the precaution to take off the load?

A. O, yes, always have started up the machine without the load. It is impossible to start it up loaded; it cannot be done.

Q. It cannot be done? A. No, sir.

Q. Well, you take the load off of it?

A. We certainly do, yes, sir.

Q. What is the—what kind of motors have you got up here?

A. We have a form K induction motor.

Q. What horse-power?

A. Well, it is rated at a hundred and seventy-five and two hundred.

Q. How much horse-power does that form K motor require to start? [187—119]

A. Well, I could start up that motor—I could start up that air-compressor with the twenty-five horse-power motor but I could not run it—give it the initial kick to get it rolling over—I could start that machine up by hand.

Q. You could start it up by hand?

A. I could give it the initial kick by hand.

Q. Then you don't need a starting surge?

(Testimony of W. S. Pullen.)

A. O, yes, we need the starting surge; we could not—

Q. Why don't you go down and turn it over by hand instead of relying on your starting surge?

Q. We have always helped that motor whenever we started up by anywheres from six to eight men on the belt, but they cut down that starting surge to a certain extent. We tried every way we knew how to start this motor without knocking out that circuit-breaker, without success; that is some of the things we tried.

Q. Notwithstanding that, I want you to tell me—just be cautious and careful in your answers so you will be all right and not get confused—how much horse-power does it require to start your motor, your form K motor at the Perseverance?

A. Well, we have started that motor up by using this gas engine which never at any time developed over two hundred and twenty-five horse-power.

Q. And you can start it with that?

A. Yes, sir, we have several times.

Q. Then, Mr. Pullen, if you get three hundred horse-power at Sheep Creek, transmit it to the Perseverance, assuming that you are actually getting three [188—120] hundred horse-power at Sheep Creek—

A. Yes, sir.

Q. —and transfer it to the Perseverance and are unable to start your motor it is due to the fact that your line and transformer losses is more than seventy-five horse-power, is that not it?

A. No, sir, our transformer and line losses will not

(Testimony of W. S. Pullen.)

equal seventy-five horse-power. It is less.

Q. If your line and transformer losses are less than seventy-five horse-power and your motor can start with two hundred and twenty-five horse-power and you are getting three hundred horse-power at Sheep Creek, you have enough power to start your motor, do you not?

A. If we had three hundred horse-power at Sheep Creek uninterrupted we could start that motor at any time we felt like it.

Q. The fact it is uninterrupted would not interfere with your starting?

A. No, but it interferes a little bit in the running of it.

Q. I am talking about the starting now?

A. You can't run it unless you get it started, can you?

Q. If you have three hundred horse-power at Sheep Creek and your line loss is less than seventy-five horse-power—line and transformer losses—

A. Yes.

Q. —you can start your motor at the Perseverance, can you not? A. Certainly.

Q. What?

A. Certainly, we have already done that.
[189—121]

Q. Then if you got three hundred horse-power at Sheep Creek and can't start your motor at the Perseverance it would be due to the fact that your line and transformer losses is more than seventy-five horse-power? A. No, sir.

(Testimony of W. S. Pullen.)

Q. Where else does the seventy-five horse-power go?

A. We do not get three hundred horse-power.

Q. I said, assuming you did?

A. Well, if we did we could start it, that would be all there was to it.

Q. That would be all there was to it?

A. Yes, sir.

Q. Why don't you use your gas plant in starting that motor? A. How is that?

Q. Why don't you use your gas plant in starting that motor?

A. Well, using the gas plant line now is another proposition.

Q. You are using part of the juice you are taking from the bus-bars at Sheep Creek in lighting, are you not, Mr. Pullen? A. At Sheep Creek?

Q. Yes. A. No, not at Sheep Creek.

Q. Aren't you using any power you get from the Treadwell Company for lighting purposes?

A. At Sheep Creek?

Q. Anywhere.

A. O, yes, for lights at the Perseverance.

[190—122]

Q. For lights at the Perseverance?

A. Yes, sir.

Q. How much are you using for lights?

A. Well, I should judge we average about thirty horse-power.

Q. How much? A. About thirty.

Q. Thirty horse-power? A. Yes, sir.

(Testimony of W. S. Pullen.)

Q. Have you tried to turn your lights out and then start your motor?

A. Yes, sir, did that every time started the motor.

Q. Turned them out? A. Yes, sir.

Q. What purposes are you using your gas plant for?

A. We run the Sheep Creek compressor with the gas plant and all the lights at Sheep Creek at present at the beach and at the portal camp.

Q. Wouldn't it be practicable for you, Mr. Pullen to get a starting surge or peak from your Sheep Creek plant—from your gas plant—shut out your Sheep Creek lights for a moment and your Sheep Creek compressor to start your machinery?

A. You mean to start the motor at the Perseverance?

Q. Yes.

A. O, yes, we have done that several times.

Q. Why didn't you do that the other day?

A. Well we could start the motor up but, as I say, the engine won't carry the load, otherwise we would not be here.

Q. I know, but after it is started, Mr. Pullen, you [191—123] have sufficient power to operate, haven't you?

A. For a short time. A very short time. The engine is overloaded and quits.

Q. When did your load quit because you didn't have power enough?

A. You mean when running on the gas plant?

Q. No, when you are running on the Sheep Creek power plant.

(Testimony of W. S. Pullen.)

A. You mean the Sheep Creek power plant of the Treadwell Company?

Q. Yes.

A. Well, the last time it quit was a quarter after two this morning.

Q. That was due to a short circuit over there.

A. No, no short circuit on our line.

Q. Short circuit on the Treadwell line?

A. Yes, I understand a short circuit on their line.

Q. Not due to the fact that they were not furnishing power. They could not avoid it?

A. Yes, due, as I understand, to a short circuit.

Q. Well, I am speaking aside from the accident—when was it your plant has shut down because of insufficient power?

A. Well, let's see, I think it was about—about a week ago—a week ago last Monday night we were up here before the Judge and we started up the motor the next day I think; it run about a day and then stopped.

Q. What caused it to stop?

A. Well, our own circuit-breaker at the Perseverance mine failed to work, that was from an overload on our air-compressor. [192—124]

Q. It was your own air-compressor?

A. It was at that time.

Q. Wasn't due to any slackening of the current at Sheep Creek? A. No, not to my knowledge.

Q. Isn't it a fact that your plant never did stop because of a lack of current furnished you from the Sheep Creek power plant?

(Testimony of W. S. Pullen.)

A. Well, we have always been very careful not to use over that fifty-six amperes.

Q. Well, it never stopped, did it?

A. Yes, I think it stopped once or twice—I can't remember the dates, but I think so.

Q. Well, tell us the circumstances so we can check you up on it.

A. Well, we were working the air-compressor on this motor and used the juice at the time, then the motor would stop.

Q. When was that?

A. Oh, that has happened—oh, I guess a couple of times.

Q. When? A. In the last month.

Q. In the last month your motor stopped—were you using your power for any other purpose then?

A. No, we were using it for lights, that is all—lights and this motor.

Q. And your motor stopped for no reason except that you were not getting power enough—that happened last month—is that the way you want to testify?

A. Well, I think—I won't say that it was—about the [193—125] last of November or thereabouts. I can't remember the dates as it occurred.

Q. It did happen then last November? A. Yes.

Q. How often?

A. Oh, I should say about a couple of times.

Q. A couple of times? A. Yes, sir.

Q. How did you get started again, Mr. Pullen?

A. Well, we didn't have any trouble starting up

(Testimony of W. S. Pullen.)

before Christmas—started in the ordinary way.

Q. Didn't have any trouble? A. No.

Q. The current was sufficient to start you?

A. O, yes, got along very nicely.

Q. And then when you started again you ran again? A. O, yes.

Q. Notwithstanding the fact that would stop your machinery because it was insufficient?

A. That is the idea.

Q. How do you account for that, Mr. Pullen?

A. I don't account for it.

Q. Must be something the matter with your machinery, don't you think?

A. No, sir, if anything wrong with that machine we would know it.

Q. If the machine will start, it requires more to start it than to operate it, doesn't it?

A. Well, yes, it—they don't start very easily.

Q. Well, it requires more to start it than it does to operate it, and you can start it nicely with a given current and it stops when operated on the same current? [194—126]

A. Well, sometimes might get a short circuit on the line—might get a break in the line—a break in one of the fuses—blow out the fuse—circuit-breaker fuse or some of those things.

Q. Some of those things probably caused the stop you spoke of in November? A. Yes, probably.

Q. Not due to the fact that the current was decreased at the Sheep Creek power plant?

A. I don't know anything about it.

(Testimony of W. S. Pullen.)

Q. You don't mean to say, then, that your machinery has stoppd because of a decrease in the power furnished at Sheep Creek?

A. I know the circuit-breaker at the Sheep Creek plant isn't as it is now the same as it was before Christmas.

Q. Well, I am not talking about that. Well, I say you know your machinery never stopped because you were furnished with an insufficient amount of current; you know that to be a fact, don't you?

A. Know that to be a fact because we were very careful not to overload that machine.

Q. I know you were careful, but it never did stop on that account?

A. Well, not to my knowledge; no.

Q. You are running now, aren't you?

A. We are; yes, sir.

Q. Is the current cut back on?

A. O, yes, about nine-thirty this morning.

Q. You are running now? A. Yes. [195—127]

Q. The circuit-breaker is still set at fifty-six amperes? A. Approximately so.

Q. And you are operating without any difficulty?

A. Yes, sir.

Q. Well, you could start with the same power that operates this—is that the way you testified a little while ago?

A. If we were given three hundred horse-power we could start that motor any time we felt like it.

Q. Can't you operate your machine with the same

(Testimony of W. S. Pullen.)

motor—start your machine with the same power that you require to operate it?

A. Yes, sir; we can start that machine with considerable less power than it takes to run that machine operating at full load.

Q. Then, Mr. Pullen, why don't you do it?

A. Well, because the circuit-breaker would never stay in—don't get the juice—we are not getting the three hundred horse-power—otherwise we would have had it right along.

Q. Listen—the circuit-breaker stayed in when you were operating, did it not? A. No, sir.

Q. Why didn't it stay in while you were operating? A. Because they wouldn't hold it in.

Q. It would not go out unless you drew more power, would it? [196—128]

A. Well, we were drawing a little amperage at the time.

Q. You were drawing more power?

A. We were drawing enough to throw it out, yes.

Q. You were drawing more power than you did when you operated, didn't you? A. Yes, we did.

Q. You told me a moment ago you could start with the same power that would require to operate.

A. Yes, if give me three hundred horse-power uninterrupted current.

Mr. SHACKLEFORD.—Now, get that out of your mind. I think the witness ought to be treated fairly.

Q. (By Mr. J. HELLENTHAL.) I will ask the question—you told me a moment ago that you could start your machine? A. Yes, sir.

(Testimony of W. S. Pullen.)

Q. —your motor with the same quantity that required to operate, did you not?

A. I think so; if we could have an uninterrupted current of three hundred horse-power.

Q. Well, I am asking you—you told me that you could start the machine with the same—without increasing the power—with the same amount of power required to operate?

A. I could start that machine with the gas engine which never developed over two hundred and twenty-five horse-power. [197—129]

The COURT.—If you will just answer the attorney's questions, pay attention to them and answer the best you can we will get along faster.

Q. (By Mr. J. HELLENTHAL.) You told me a moment ago you could start that motor with the same quantity of horse-power that required to operate?

A. I could start that motor with less power than it takes to operate it if we could have an uninterrupted current than required to operate.

Q. Will less current than required to operate if uninterrupted? A. Yes, sir.

Q. You could operate and did operate with a circuit-breaker at fifty-six amperes, did you not?

A. Yes, sir.

Q. Is that not true? A. Yes, sir.

Q. In fact, you never shut down because the flow of current was not enough for you to operate on?

A. Not to my knowledge, no.

Q. Then, ultimately, when you attempted to start

(Testimony of W. S. Pullen.)

you used more than fifty-six amperes, which is evidenced by the fact that the circuit-breaker went out?

A. Well, I suppose that circuit-breaker was set at fifty-six amperes.

The COURT.—I want to say this to the attorneys, I don't think there is much use of wasting much time on the question you are trying now.

Mr. J. HELLENTHAL.—I am trying to find out why [198—130] they imposed on the Court.

The COURT.—The attorney for the plaintiff company, if I understood him correctly, stated very frankly that the contention is just as stated in the complaint, that they want a surge—that is, they want more than the three hundred horse-power.

Mr. SHACKLEFORD.—Let it be understood in the record right here that our contention is that we are entitled to an uninterrupted current of three hundred horse-power, that if the defendant companies do not give us it that we are entitled to that thing which will give us its equivalent, namely, a starting surge.

A. (By the WITNESS.) I would like to say that I am not trying to evade any questions that Mr. Hellenenthal asked me. I am answering them the best I can. He does not ask his questions so one can answer them intelligently.

Q. (By Mr. J. HELLENTHAL.) Don't you understand me, Mr. Pullen?

A. No, I don't always understand you.

Q. You understand English, don't you?

(Testimony of W. S. Pullen.)

A. Yes, sir, I do.

Q. I want you to answer this question just because you have shown a disposition that you want to answer it. Don't care to insist upon it. If you could start with the same power that you use in operating your machinery and you had enough power to operate it follows that you had enough power to start; is that not true? A. Yes.

Q. Then, why the other day when you were shut down, why [199—131] did you start instead of coming up here to the Court trying to get something beside what you had any use for?

A. We tried every known means of starting that motor without coming up here; if we had been able to start it wouldn't have come up before you.

Mr. J. HELLENTHAL.—That is all.

Redirect Examination.

Q. (By Mr. SHACKLEFORD.) Just one question, Mr. Pullen. Counsel has asked several questions here with reference to the gas plant and the record has been left in a state where it might be misconstrued. I understand you to say that you are able to start this machinery with a gas plant and run on it for how long?

A. About an hour and a half.

Q. Now, just tell the Court of your attempt to make the flying-switch and get on the current of the defendant companies?

A. We tried to start this motor up, Judge, this way; by starting first on the gas engine and getting up speed and then throwing it over on to the Tread-

(Testimony of W. S. Pullen.)

well Company by the method known as a flying-switch. One time the motor stayed on the line I should say for about three minutes and then the circuit-breaker went out. One other attempt we made stayed on about two minutes. We tried it two or three times [200—132] and before that without any success. The circuit-breaker would fly out immediately.

Mr. HALLENTHAL.—That is all.

Mr. J. HELLANTHAL.—That is all.

Witness excused. [201—133]

[Testimony of H. L. Wollenberg, for Plaintiff.]

H. L. WOLLENBERG, being called and duly sworn, testified as follows on behalf of the plaintiff:

Direct Examination.

Q. (By Mr. SHACKLEFORD.) Mr. Wollenberg, I do not know as the record can be used in this trial on the merits so I will ask you the same preliminary questions I did the other night. Just state your name, residence and occupation.

A. H. L. Wollenberg; residence, Juneau, Alaska; occupation, mining engineer; occupied as chief engineer of the Alaska Gastineau.

Q. Are you in charge of all the electrical work of the Gastineau Company, Mr. Wollenberg?

A. I am.

Q. Let's see; what school are you a graduate of, Mr. Wollenberg? A. University of California.

Q. Are you in charge of all of the construction of the Salmon Creek power plant? A. I am.

(Testimony of H. L. Wollenberg.)

Q. Just state generally and for the record what the size—the proposed size and capacity of that plant is?

A. The Salmon Creek plant is to consist ultimately of two units which will develop six hundred horse-power and of two power stations, each power station consisting of two units. And we are now completing the installation of the first unit, which has a capacity of two thousand horse-power. And the general electrical system of our company consists of this source of power—that is the Salmon Creek [202—134] course of power and the gas engine auxiliary and the three hundred horse-power which is spoken of.

Q. These various works which you are engaged in at the present time? A. I am.

Q. How long have you been in active practice, Mr. Wollenberg, of your profession?

A. Well, since—since 1902, but after a few years in practical work I went to the University, so that four years of that time since 1902 have been occupied in the University.

Q. That is 1902 to 1906?

A. No, from 1904 to 1908 I was.

Q. Now, Mr. Wollenberg, have you that sketch—refer to this sketch. If the Court please, we would—if your Honor please, I would like to have the witness show you this sketch.

The COURT.—Has it been shown to the defendants?

Mr. SHACKLEFORD.—Just a sketch showing

(Testimony of H. L. Wollenberg.)

the general connections in a general way of the power plant.

Q. I wish you would explain to the Court the general system with reference to the connection of the Sheep Creek power plant with its various places of consumption and its connection with other power plants of the defendant companies?

A. The diagram shows the two generators of the defendant companies at Sheep Creek, each of which are marked one thousand kilowatts, rated at eighty-five per cent power factor; these two generators, [203—135] either independently or simultaneously, can send current into the bus-bars of that plant. On this diagram one line represents three phase—one line stands for three—from the bus-bars of this plant which is fed by either one or both of these generators and the feeder which I call the Treadwell feeder, being controlled by a time limit circuit-breaker and having on it the following indicated instruments: an ammeter, voltmeter and wattmeter, that feeder has taps off; part leads to the operations of the Alaska Juneau mine and then goes to furnish the Treadwell with the other power sources of that company; the circuit—the feeder which supplies the Alaska-Castineau occupies the same position with reference to the Sheep Creek plant that their own plant does. It, however, is controlled by an instantaneous circuit-breaker and an ammeter and a ——— recording wattmeter. The Nugget Creek generator and at times the steam turbine generator of the defendant

(Testimony of H. L. Wollenberg.)

companies operate in parallel with the Sheep Creek plant.

Q. That is to say, Mr. Wollenberg, that they are synchronized?

A. They are synchronised; that is an equivalent expression.

Q. Their general supply of electricity is thrown into one current; one set of currents?

A. Exactly.

Q. Now, have you explained the situation with reference to what appears upon the board which gives to us—what gives to the plaintiff company their [204—136] connection?

A. On the plaintiff company's there is an instantaneous circuit-breaker and an ammeter, while on the panel feeding their own circuit there is a time relay circuit-breaker and an ammeter, voltmeter and wattmeter.

Q. Now, then, I will ask you, Mr. Wollenberg, have you made any inquiry to find out the power consumed at Sheep Creek prior to the fall of 1909—have you that data with you? A. Yes.

Q. 1909, at the time this contract was entered into?

Mr. J. HELLENTHAL.—What has that got to do with it? I object to that, incompetent, irrelevant and immaterial.

The COURT.—Will you kindly read the question, I will rule on it.

Q. (Read by Reporter.) 1909, at the time this contract was entered into?

Q. (By Mr. SHACKLEFORD.) Sheep Creek

(Testimony of H. L. Wollenberg.)

mines—I will amend the question and refer to the Sheep Creek Mines?

The COURT.—Well, the Sheep Creek mines—does that include the Perseverance?

Mr. SHACKLEFORD.—No, sir; that is the mines mentioned in the letter offered this morning.

The COURT.—May I see it?

Mr. SHACKLEFORD.—That is the purpose mentioned also in the question.

Mr. J. HELLENTHAL.—I do not understand the purpose of this testimony, your Honor. [204½—137]

The COURT.—Just a moment, Mr. Hellenthal.

Mr. SHACKLEFORD.—I will explain the matter.

The COURT.—You might make yourself clear as to the purpose of the testimony.

Mr. SHACKLEFORD.—If the Court please, we desire to prove at this time that the power consumption referred to in the letter of Mr. Bradley was subject—that a surge was necessarily implied in the offer to contract from the surrounding circumstances.

Mr. J. HELLENTHAL.—Now, your Honor, we object to that testimony as incompetent, irrelevant and immaterial. It wouldn't make any difference what representations Mr. Bradley made or did not make; the action wasn't one brought to set aside the contract for false representations, for fraud; but if any fraud was practiced upon these people they have condoned the fraud and preferred to stand upon the contract and are asking for the enforcement of the contract itself, and the contract—the construction of

(Testimony of H. L. Wollenberg.)

the contract would necessarily depend on the terms of the contract itself.

The COURT.—Objection overruled; exception allowed.

Q. (By Mr. SHACKLEFORD.) Now, just go ahead, Mr. Wollenberg, and state to the Court—

A. Why, I made an investigation of the condition of the mine prior to that time and what equipment at that time, prior to that time and find it to be as follows: there was at the beach power-house, [205—138] which is located at or near the site of the present Sheep Creek plant, a compressor—

Mr. J. HELLENTHAL.—Just a moment, Mr. Wollenberg. I wish to add the further objection, your Honor; that is this, there is nothing to show—there is nothing to show that the Oxford Company at that time was owner of the Sheep Creek property. The fact of the matter is that they were not the owners of a large portion of the property at Sheep Creek. They were only the owners of a very small portion of the property situated at Sheep Creek. I presume—I don't know how Mr. Wollenberg—I might make another objection to Mr. Wollenberg's testimony—there is nothing to indicate how he inquired into these things, got from hearsay, from other people, or whether he knew anything about it himself; but, assuming that it wasn't hearsay, that Mr. Wollenberg knew about the matters himself, even then the question is what was included in Mr. Bradley's statement in regard to that Sheep Creek mine. If they didn't own any mines at Sheep Creek except what was on

(Testimony of H. L. Wollenberg.)

the beach there, why that ends it.

The COURT.—You can show that part of it on cross-examination.

Mr. J. HELLENTHAL.—No, your Honor, that is part of their case to show it, not ours.

The COURT.—I mean if the testimony of this witness is as to fraud. As to competency of the [206—139 testimony there is no question in the Court's mind, as already ruled. The Court wants to be informed of the conditions surrounding the parties at the time they entered into the contract in 1909. I assume that this will give some information to the Court. For that reason I have ruled as I have. You may proceed.

Mr. J. HELLENTHAL.—Your Honor will however require the witness to state the sources of his information?

The COURT.—You may do that on cross-examination.

Q. (By Mr. SHACKLEFORD.) Go ahead, Mr. Wollenberg.

A. There was at the beach a single cylinder compressor driven by a water-wheel of approximate size 14 inches by eighteen inches, which operated at one hundred revolutions per minute and which, if the compressor called for one hundred pounds' pressure per square inch would consume one hundred horse-power. There was in addition to that a displacing compressor of approximate sized cylinder eighteen inch diameter by eighteen inch stroke which, running at one hundred revolutions per minute and compress-

(Testimony of H. L. Wollenberg.)

ing air under one hundred pounds to the square inch would consume one hundred and sixty-five horse-power. There was also an eighty horse-power multipolar Westinghouse generator which would consume something more than its rated output of eighty horse-power, at least eighty horse-power, in operating at normal condition. There was also a [207—140] generator of twenty-five horse-power. The total of this installed equipment was 380 horse-power.

Q. That includes the stamp-mill?

A. That is the installation of the particular units either for producing electrical energy or for compressed air at the beach power-house; and the operations of the mine at that time involved the running of a 30-stamp mill, which would require between 50 and 60 horse-power; two rock crushers, which would require 25 horse-power; lights at various points of the camp, requiring 10 horse-power; and electric hoist in the mine requiring 15; two pumps requiring at least 10, and two air hoists requiring about 25. In addition to this, the entire output of air from the compressor itself at the beach was used in operating rock drills, except, of course, the air which leaked through the pipe-line on the way to the beach from the mine. Assuming, however, that there was a large leakage and that at least five drills were necessary to the operation of the mine for the supply of its 30-stamp mill and necessary development work we would have 75 horse-power for drills. The total of these figures is 261 horse-power.

Q. That is the total consumption?

(Testimony of H. L. Wollenberg.)

A. Accounted for.

Q. Probable total consumption from that equipment?

A. Exclusive of the line loss, that is in the air loss.
[208—141]

Q. (By Mr. J. HELLENTHAL.) Be how much?

A. Two hundred and sixty horse-power.

Q. (By Mr. SHACKLEFORD.) That air line—that present air line is on the property there?

A. Well, part of it there is on the property.

Q. Not in use though? A. It is dismantled.

Q. The compressor has been moved up—there is a new compressor installed right at the mouth of the tunnel? A. By our company, yes.

Q. Now, assuming that the power consumption at the Sheep Creek mines in October, 1909, at the time this contract was executed, with a starting load, could that property have been operated on two hundred horse-power without considering the fact that the Treadwell Company was not going to give a starting surge? A. Repeat the question, please.

Q. Well, assuming for the moment that it was the intention of Mr. Bradley not to give a starting surge upon the current which he proposed to give to the plaintiff company or to its compressor, could that property have either been operated or started on the two hundred horse-power provided for in the contract at the time it was drawn?

A. Well, it depends on—you would apply that two hundred horse-power to the same machines that were then in use?

(Testimony of H. L. Wollenberg.)

Q. Yes—I am assuming—I am assuming that the plant [209—142] would necessarily be reconstructed because of the change in the compressor, the ground upon which the compressor having been—on which the compressor was situated having been given over to the defendant companies?

A. Well, the compressor they had in—the large one of the two, is comparable in size with the one which we are now endeavoring to start from this current and certainly could not have been started if arranged as our compressor is now arranged, that is driven in that way.

Q. Could it have been started with two hundred horse-power without a reasonable surge?

A. Not if installed with a motor as this one is.

Q. Now, I wish you would go ahead and describe to the Court the exact working condition with reference to starting of the machinery at the Perseverance mine and the operation and conditions with reference to the operating conditions under which we are permitted to take this so-called three hundred horse-power current at the present time?

A. Well, our installation consists of a two hundred horse-power form K motor, belt connected to a compressor. The compressor is equipped with devices for unloading the compressor so that it starts without—without being against any air pressure load—the transformation and lines leading from Sheep Creek to that motor and other lights which are a minor part of the same load but which we did not have on when we tried to start—start the motor

(Testimony of H. L. Wollenberg.)

[210—143] in every way—I mean best engineers' practice and with standard practice, to the best of my knowledge and belief, that we were connected to a generating plant of large capacity consisting of two or more generating units operating in synchronism or leading into the same line and on which the voltage is attempted to be maintained uniformly high—uniformly constant currents, a condition together with the characteristics of this motor which we have in use, which upon starting that motor causes a loss of current or amperage. Now the—that condition exists in part due to the inherent factor of that motor which was to take a large surge upon starting, and in part due to the ability of the generating system to yield that surge of power. Now, in thinking of an electrical circuit and speaking of so much power and such and such a sum being delivered at a point, it is misleading because the power doesn't occupy that circuit or travel upon that circuit until the load exists upon that circuit for it. In other words, there is no way of putting fifty-six amperes at twenty-three hundred volts at the end of a line and saying "Take it." The amperage on that line is going to be controlled by the loads upon that line. In this system where the voltage is artificially maintained high for the purpose of keeping these various plants operating in synchronism, it is a necessity for the operation of the plant in parallel; but it is not a necessity for the operation [211—144] of single plants.

Q. In other words, it is not a necessity to the de-

(Testimony of H. L. Wollenberg.)

fendant companies in view of the fact that they have synchronized two or three different sources of electrical supply, some of which are not mentioned in the contract in this case?

A. That is it exactly. Well, this motor which we have connected with this compressor is a standard ordinary motor for mining and milling and general service and has advantages over any other motor for similar work which make it the ordinary motor used. It has a characteristic that—when you start it it will take a surge of current. Now, under normal conditions if it is deriving that current from some source which is simply capable of a certain output it will compensate for that increase in amperage by a decrease in voltage, but if it can wet it it will take that surge of amperage and if you have an artificially maintained high voltage at the same time, why, of course, there is a certain surge in the apparent kilowatts.

Q. That is to say theoretically you require more than three hundred horse-power to start three hundred horse-power machinery, theoretically under those conditions?

A. Under those conditions you do, yes. Yes, under those conditions you do so. Now, that condition requiring the surge for starting is a condition of such brief duration that it does not affect materially the service of the power available at [212—145] the power plant that supplies that energy.

Q. That is this surge doesn't do any particular injury—or what if any particular injury would this

(Testimony of H. L. Wollenberg.)

surge do to the general supply or surplus supply of the defendant companies that they obtain from the same plant?

A. Well, considering the case as it is with their plant carrying a load perhaps in excess of two thousand or three thousand horse-power, I am not informed on that point, why this surge of amperage is a trifling matter on their system and will not practically or theoretically have any disastrous or even seriously undesirable effect on their system.

Q. Would it have any power driving qualities so far as practical operation is concerned?

A. Not so far as practical operation is concerned, it would momentarily, it would momentarily call for a surge of amperage and since the voltage is maintained constant that will imply a certain surge of power under the existing conditions; that surge of power occupies such a brief duration that it will be absorbed by the system without any particular effect and no better proof of that can be obtained than an actual demonstration at the plant of the company. It is a simple matter to absolutely prove at the plant of the defendant companies.

Q. Now, it has been said here, Mr. Wollenberg, that when we start the machinery at the Perseverance mine we actually take nine hundred horse-power, [213—146] that is to say that we start at three hundred or you take three times the normal load. Is that actually true, with horse-power measured in watts?

A. Well, I can't answer that exactly because the

(Testimony of H. L. Wollenberg.)

surge is of such momentary duration, and then you might make—the power factor at this particular time, starting time, is unusually low—the power factor of this motor upon starting is very low, which reduces the power which corresponds to this surge of amperage—power always being the product of amperage times voltage times power factor.

Q. Let's take this instance, for example: The defendants in their answer in this case filed this morning aver that the Sheep Creek plant at the present time is producing five hundred horse-power. Is there any doubt in your mind as to your ability to start machinery consuming three hundred horse-power, less line losses, under those conditions?

A. There is no doubt in my mind whatever. There can't be any doubt in my mind when we were able to start the identical apparatus with a gas engine plant whose maximum production is a little some over two hundred horse-power.

Q. Well, take for example the instance of the Sheep Creek power-plant at a time when its flow of water is so reduced it is only producing three hundred horse-power, what would be the result with reference to starting? Would you be able to start with three hundred horse-power? [214—147]

A. Certainly would, and even with the Sheep Creek power plant only producing three hundred and then disconnected from their system, which it properly should be, when only producing three hundred or less should be disconnected from their system, and where it was it would occupy a position exactly like the

(Testimony of H. L. Wollenberg.)

gas plant, being an independent source of power, and could absolutely start up.

Q. What do you say as to that condition where the flow of current was 300 horse-power, no more and no less, and was uninterrupted?

A. I should say that it would unquestionably start such a load.

Q. Under the present conditions, is it possible for you to secure the use or the benefit or the enjoyment of 300 horse-power without taking a starting surge of amperage?

A. No, not under the present conditions with the apparatus as installed.

Q. Well, I am speaking of the conditions as they exist at the Sheep Creek plant?

A. And as they exist at the Perseverance mine.

Q. Yes, sir. Now, the drawing of this current upon these surges of amperage, I wish you would assume for the sake of the question that the value of the horse-power on the peak load is \$87 per annum. I want you to demonstrate to the Court the value of one of those surges as it would be estimated on a wattmeter?

A. Well, if you take power at \$87 a year it is [215—148] equivalent—

Mr. J. HELLENTHAL.—Your Honor, I think that is quite immaterial and irrelevant.

The COURT.—Only on the question of damages.

Mr. SHACKLEFORD.—I think, if the Court please, we have a right to go, of course, not only to some extent into the question of damages but into

(Testimony of H. L. Wollenberg.)

the illustration of all the effects produced in the other of all the plant and also on the doctrine that it is the duty or the function of the Court in administering and construing a contract to ascertain whether it is dealing with minimums or whether it is dealing with something that is of substantial effect.

The COURT.—Well, I doubt whether the value would have very much to do with that part of the case. You may proceed.

A. Well, if power is assumed to be worth \$88 a year, it works out as being one cent for every horse-power, or the use of a horse-power for one hour is worth one cent. Well now, we will take—the defendant companies claim that we consume three times the normal horse-power during a start, in other words we will assume for the moment that we consume 300 horse-power during a start. Now, I take 600 horse-power, which we have assumed to consume in starting; if that surge lasted one second its commercial value would be one-sixth of a cent; if it lasted 20 seconds it would be four cents.

Q. That is within the limits, however, of the length of the probable surge? A. Very much.

The COURT.—We will adjourn until to-morrow at 10 o'clock, when this case will be taken up. [216—149]

[Testimony of H. A. Bishop, for Plaintiff.]

H. A. BISHOP, being called and duly sworn, testified as follows on behalf of the plaintiff:

Direct Examination.

Q. (By Mr. SHACKLEFORD.) Mr. Bishop,

(Testimony of H. A. Bishop.)

just state your name and residence.

A. H. A. Bishop; Juneau, Alaska.

Q. Mr. Bishop, were you in charge of the Sheep Creek power plant prior to its reconstruction, with the Treadwell Company at any time?

A. I was in charge at the time it was closed down. I don't remember what year. It was six or seven years ago.

Q. You have—you know what machinery was in that power plant and what was in the Sheep Creek mine? A. Yes.

Mr. J. HELLENTHAL.—This testimony, your Honor, I object to for the same reason I objected to the same testimony yesterday.

The COURT.—The record may show the same ruling and exception allowed you.

Q. (By Mr. SHACKLEFORD.) All right, Mr. Bishop, just give the machinery?

A. In the power-house?

Q. Yes, state whether in the power-house and go all over the property.

A. In the power-house at the beach there was one straight line compressor, 14-inch cylinder in diameter and 18-inch stroke, I think—I would not be positive about the 18-inch stroke, whether 16 or 18—and there was one duplex compressor, the diameter of the cylinders were 16, and my recollection is that the stroke [217—150] was also 16; and there was one 80 horse-power Westinghouse direct current 500 volt electric generator; and at one time they had a 25 horse-power direct current generator of the Sprague type, 500 volts.

(Testimony of H. A. Bishop.)

Q. This is what was known as the lower power plant at Sheep Creek? A. That was on the beach.

Q. There was another power plant up above where the intake of the lower power plant was, wasn't there? A. Yes.

Q. Do you recollect approximately what the capacity of that plant was?

A. Well, there was installed in it a 75 horse-power Sprague generator and 75 horse-power C. & C., although they never both operated at the same time.

Q. Now, going on up the creek, what machinery was there in operation at the Sheep Creek mine?

A. At the mine?

Q. At the mill—start in the mill and going on up to the mine?

A. Well, in the mill there was one 50 horse-power C. & C. direct current 500 voltameter and one Sprague 50 horse-power, same voltage, direct current.

Q. Beside your motor, what was there?

A. And there was a 25 horse-power motor which ran the rock crusher in the top of the mill, and that was all of the machinery—power machinery in the mill excepting a water-wheel which ran the vanners.

Q. Now, outside of the motor, the generators of the motor described, what was there for this power to [218—151] operate—there was a mill—what was the capacity of the mill?

A. 30 stamps in the mill.

Q. How many rock crushers? A. Two.

Q. How many lights, approximately, Mr. Bishop?

(Testimony of H. A. Bishop.)

A. O, I suppose there was probably one hundred.

Q. What about the mining operations, what was operated in the mine proper—was there anything else in the mill besides the rock crusher, the lights and the stamp-mill? A. Nothing.

Q. Well, now, at the mine, what was it operated by—power?

A. At the mine they used air drills and they had two hoists which used air; they were—one was a double cylinder hoist and one was a single play—small one was a timber hoist I believe, used only for hoisting timber; the other for hoisting the bucket. That weighed, I think, about 500 pounds, that is carried 500 pounds of ore.

Q. How much power was necessary to run that beach compressor—how much power would it take, approximately, Mr. Bishop?

A. Well, I don't know—I don't know that I ever calculated the hoist power on it. I should judge that it probably took something like 150 horse-power. It was a 3-inch nozzle, usually, I think, it was about 3 inches, might be fraction of an [219—152] inch more or less on the pipe.

Q. What was the head? A. 270 feet.

Mr. SHACKLEFORD.—I think that is all.

Cross-examination.

Q. (By Mr. J. HELLENTHAL.) When was this, Mr. Bishop—I say, when was this?

A. When?

Q. Yes.

A. That was at the time the mine was operated by

(Testimony of H. A. Bishop.)

Mr. Hammond and Malony, about seven years ago, I think; I don't remember what year it was.

Q. (By the COURT.) Operated by whom—Malony and whom?

A. Mr. Hammond and Mr. Malony and Meyers.

Q. (By Mr. J. HELLENTHAL.) Those two compressors, Harry, never ran together?

A. Yes, sir, they always ran together.

Q. They always ran together?

A. Yes, when there was water enough to run them.

Mr. HELLENTHAL.—That is all.

Mr. SHACKLEFORD.—That is all, Mr. Bishop.

Witness excused. [220—153]

**[Testimony of H. L. Wollenberg, for Plaintiff
(Recalled).]**

H. L. WOLLENBERG, heretofore duly sworn, being recalled for further direct examination, testified as follows, on behalf of the plaintiff:

Direct Examination.

Mr. SHACKLEFORD.—If the Court please, I think I can close our case very rapidly and save a good deal of time by offering the general outline of testimony that was offered the other day by offering Mr. Wollenberg's deposition transcript and Mr. Zackhouse at this hearing, and then I will examine Mr. Wollenberg on the more important features with reference to the power factor and try to get through.

Mr. J. HELLENTHAL.—I shall object to that, your Honor. I want the testimony in this hearing in this record. The witnesses are here in this controversy.

(Testimony of H. L. Wollenberg.)

The COURT.—Well, I presume I would have to sustain your objection. You may proceed.

Mr. SHACKLEFORD.—Very well.

Q. Well, start, Mr. Wollenberg—originally the power of this power line was opened to our company, to the plaintiff company by the defendant companies, about the 8th of November?

A. On the 8th of November.

Q. Did you have any difficulty in starting?

A. Well, at the time that they—that that power was formally turned over to us simply constituted the closing of a switch, and the closing of the switch didn't transmit any power on to the line until we [221—154] put a load on it, and that same day, I believe, we put a small lighting load on calling for a few amperes, and the following day we started the Sheep Creek compressor with it, perhaps the same day—in the afternoon of the same day we started the compressor of the Sheep Creek portal with it without difficulty.

Q. Well, then, later what was done with reference to putting the load on the Perseverance—about what time?

A. Perhaps if I just go through a chronology of it it will be the shortest way. We had a load on there from November 8th continuously until November 29th, when the circuit-breaker opened and it was closed again that day, and then—

Q. How long was it open?

A. It was open an hour at that time.

Q. All right.

(Testimony of H. L. Wollenberg.)

A. Then on December 2d the combined loads of the Sheep Creek from the Perseverance plants were put on the circuit.

Q. Now, at that time, Mr. Wollenberg, have you any means of knowing what the circuit-breaker was set at, that is at what amperage?

A. Merely hearsay. It has never been possible to enter the plant of the defendant companies and determine by simply looking at their meter what it was set at, for they installed there a meter which does not read according to the calibrations on the face of it, according to the [222—155] readings on the face of it.

Q. That is an ammeter? A. An ammeter.

Q. That is set on the plaintiff company's line?

A. Yes. And in addition to that, it would not be possible, except by actual test, to know what that ammeter would read when the circuit-breaker went out. Of course, the circuit-breaker is marked for a certain setting, but the only real accurate way is to observe it when it goes out.

Q. Well, what I mean to say is, approximately, what was that circuit-breaker set at, from your observation at that time?

A. Well, we know that at that time we were drawing up to 80 amperes without causing the circuit-breaker to go out; that we have of our own definite knowledge, so we could say it was set above 80 amperes.

Q. Now, approximately, when was that changed?

A. Well, our records indicate that it was changed

(Testimony of H. L. Wollenberg.)

about the 6th, apparently the 6th of December, because on the 8th of December the circuit-breaker went out at a load condition which we have means of knowing was somewhere around 50 amperes, whereas previous to the 8th we know we carried 80 amperes on that circuit.

Q. While we are on this subject, I wish you would go *through book* there and explain to the Court, into the record, and to the Court the number of interruptions that have occurred to this current and the length of time of interruption—the character of [223—156] service that has been given to us under this contract for an uninterrupted current.

A. Well, the first occasion of which I have a record here is on the 29th, when the circuit-breaker went off at 4:30 and was closed an hour later. In that instance, I am informed, it was closed by the operator at the Sheep Creek plant of the defendant companies. On the 5th of December the circuit-breaker—that should be the 4th of December, that is the night of the fire—the circuit-breaker went out at about midnight some time and was closed at 9:30 the next morning. On the 8th the circuit-breaker went out at 9:30 P. M. and was closed at 9:30 the following morning, twelve hours later. On the 9th it went out at 9 P. M. and was closed at 9 A. M. the next morning, also an interval of twelve hours. On the 11th it went out at 10 A. M., and was closed at 11 A. M., an interval of one hour. On the 24th—there was no interruption—on the 25th the circuit-breaker went out at 11:30. It was closed immediately. On the

(Testimony of H. L. Wollenberg.)

26th it went out at 3:30 P. M. It was closed at 5 P. M. And then on the 27th it went out at noon; was closed at 2 P. M., and then it was out again at 11:30 A. M. and was closed at 2:30 P. M., and then went out again at 2:35 P. M.

Q. (By the COURT.) On what day?

A. This is the 28th—the 28th at 2:35 P. M. it went out and was closed at 4:30 P. M. On that particular instance, on the 28th, the plaintiff company was endeavoring to start the motor on—by synchronizing [224—157] or by flying-switch—trying both ways.

Q. (By Mr. SHACKLEFORD.) With the gas plant?

A. Yes, and had so advised the defendant companies, and at the time you will note there that it went out twice that afternoon, and at 2:30 when it was put in we notified them that we were going to make another trial and to kindly remain at the plant and restore the circuit-breaker. That request was not complied with, and when we made our second trial at 2:35 we had to wait until 4:30, until the man came back from Treadwell.

Q. Now, Mr. Wollenberg, I want to ask you—

A. That wasn't all I had to say.

Q. You have some more?

A. Yes. That takes us up to the 29th—well, on the 30th, having made these unsuccessful attempts to start the motor in any way whatever—having attempted every known device that we could think of, on the 30th at 8 P. M. we had a preliminary hearing in this court and on the 31st we started it about 3

(Testimony of H. L. Wollenberg.)

o'clock under stipulation with the defendant companies. The following morning at 8 o'clock, approximately, the circuit-breaker went out, and the starting surge was refused, so that then we were unable to start until 7 o'clock that evening, by order of the Court. That takes us to the first. Then on the morning of January 7th the power went off the line at 2:15 A. M. and came back on our line at 9:30 A. M. This is the time of the short circuit mentioned by the defendants which occurred day before yesterday morning, and we were then refused a starting [225—158] surge until 9:20 that morning, when a man came over from Treadwell. That is, we were refused—when we notified the Treadwell power plant and we were unable to get notice to the Treadwell earlier than that—that is, we tried from 2:30 and we were finally allowed to start at 9:30.

Q. You were able to get Treadwell on the phone shortly after the break?

A. No, we got the Douglas operator and got no connection with anyone at Treadwell, no answer on the line until 6:30.

Q. Well, now, just explain so it will not only be clear to the Court but clear in the records the distance between the place known as Treadwell and the power plant of the defendant companies here—the situation.

A. Well, Treadwell is located on the western side of Gastineau Channel and the Sheep Creek powerhouse on the easterly side; the width of the channel, or the distance between the Treadwell wharf and the Sheep Creek wharf, which is the only natural way

(Testimony of H. L. Wollenberg.)

of transportation between the two places, is probably a mile and a half—two miles.

Q. Across Gastineau Channel?

A. Across Gastineau Channel, which is an inlet from the North Pacific Ocean and subject to the—to severe weather conditions.

Q. Particularly in the winter?

A. Particularly in the winter. Then from the wharf landing at Sheep Creek to the Sheep Creek power-house is about 2,000 feet, over which distance there [226—159] is no road and which it is difficult to travel along the shore at night or at high tide.

Q. Now, I want you to explain into the record also the situation of the defendant companies at that plant with reference to having electricians constantly in the plant. How many people are employed by the defendants who have charge of the Sheep Creek plant and are there all the time?

A. Well, to my knowledge, there are three operators in that plant and one of them is on the service at the plant—in the plant at all times of the day, and that operator performs all the ordinary functions of an operator in such a generating plant, including the necessary switching that is done on their own lines and—

Q. Do you know of any instances where switching has been necessary over there except where the plaintiff company has been involved in the thing, where they have required delays of this sort?

A. I do not.

Q. Have you had any talk with anyone represent-

(Testimony of H. L. Wollenberg.)

ing the defendant companies about the difficulty and inconvenience of this service?

A. I have talked to their operators at the Sheep Creek plant in an effort to find some explanation of such remarkable procedure and they were able to offer none.

Q. Has any explanation ever been offered by Mr. Kinzie or anyone else as to the reason why they insist [227—160] upon interrupting this current after it has once blown out or after the circuit-breaker is once thrown out for a period of from one to four to five to six hours before it is restored?

A. Well, Mr. Kennedy has remarked to me that it was a penalty for our trying to draw more power.

Q. I see. Now, I will ask you if about the time the first stipulation or temporary restraining order was issued out of this court, if a request was made of the defendant companies to permit the plaintiff to place a wattmeter upon the panel board or in the power-house at its connection with the defendants' line?

A. Yes. On December 29th I personally went to the Sheep Creek power-house of the defendant companies and requested the chief operator to allow me, for the Alaska-Gastineau Company, to make a wattmeter measurement of the current being supplied us. He replied that it was not within his power to do that, and rang up Mr. Kinzie and informed me immediately that the request was refused.

Q. That is you intended to put a wattmeter on there at that connection?

(Testimony of H. L. Wollenberg.)

A. At that connection on our feeder circuit, yes.

Q. Now, at the time the power was turned on, after the last restraining order, I think it was on the first of January—on the morning of the second, what, if anything, was done with reference to the exclusion of the operators of the plaintiff company from being present and observing the situation in that power-house [228—161] with reference to the matters and arrangements at the time that current was turned on?

A. Well, we sent a man down there at the time that it had been arranged for turning the current on and he was informed that they didn't want him in there, and a day or two later—

Q. Was he given any information as to where that instruction came from? A. I can't say as to that.

Q. (By Mr. J. HELLENTHAL.) You was present—what is it—all hearsay?

Q. (By Mr. SHACKLEFORD.) Now, do you know anything, Mr. Wollenberg, about the closing out of the telephone connection and the refusal to answer the telephone—there is a telephone line between your gas plant and their line?

A. Why, no; I have no personal knowledge of any refusal to answer the telephone. I called there personally three days ago and was allowed entrance to the plant but was informed by the operator that he had orders from Mr. Kinzie to give no information to the Alaska-Gastineau people and not to have them in there. I asked him if he intended to ex-

(Testimony of H. L. Wollenberg.)

clude me from the power-house and he said that was his orders.

Q. I will ask you, Mr. Wollenberg, to explain who installed the 'phone connections and for what purpose that connection was made.

A. Why, we installed the 'phone connection connecting our line with the Sheep Creek power plant, because [229—162] in the operation of any electrical distributing system there will frequently arise conditions where it is necessary for the generating plant to be notified of certain conditions or for the consuming plant to be; and in an effort to make all provisions that we could for continuous service and satisfactory service we installed that telephone connection at our own expense.

Q. Assuming for the time being that a circuit-breaker may properly go out, do you know what length of time ought to be—what is the maximum length of time that ought to be consumed in getting that power back on the line?

A. Yes, the ordinary practice in a generating plant if a circuit-breaker on the line opens up is to replace the circuit-breaker at once, immediately—if the circuit-breaker flies out and it indicates a continuance of the disturbance on the line which originally made the circuit-breaker fly out, then the generating plant attempts to locate the trouble either by communication with the points along the line or by being communicated with by some point along the line where such disturbance or trouble exists.

Q. How long ought it to take to make the connec-

(Testimony of H. L. Wollenberg.)

tion again after one of these ordinary interruptions as described by you?

A. Why, their circuit-breaker at that point might go out without the operator's noticing it, he might [230—163] be in another part of the building. If such should be the case, might take until we could raise him on the telephone to notify him it was out and ask him to replace it.

Q. Otherwise it oughtn't to take thirty seconds?

A. It oughtn't to take any time otherwise, unless he should chance to be not near the telephone or the switch-board.

Q. There is one other question, Mr. Wollenberg, in connection with the power situation—is there any other source of power than the power of the defendant companies from which power could be drawn at the present time for the use of the plaintiff?

A. There is not; the plaintiff company has a gas engine plant which is inadequate to carry the Perseverance load, and a number of attempts have been made and every effort has been made to have it carry that, and they have failed, and there is to my knowledge no other source of power that can be utilized or purchased or in any way made available for that mine.

Q. Now, Mr. Wollenberg, we will get down to this question as to how much power we are being deprived of by these operations complained of in the plaintiff's complaint—I wish you would please give to the Judge the standard definition of power factor.

(Testimony of H. L. Wollenberg.)

A. Well, I would like to read that directly from the [231—164] Electrical Engineers' Pocketbook by Foster. I am reading from paragraph 3, page 504, under chapter entitled "Definition and Explanation of Terms." The same being a copy of the standardized rules of the American Institute of Electrical Engineers, and reads as follows: "III. Power Factor and Reactive Factor. The power factor in alternating current circuits or apparatus is the ratio of the electric power in watts to the apparent power in volt-amperes. It may be expressed as follows:

$$\frac{\text{true power}}{\text{apparent power}} = \frac{\text{watts}}{\text{volt-amperes}} = \frac{\text{energy current}}{\text{total current}} = \frac{\text{energy voltage}}{\text{total voltage}}"$$

and then it follows with other equivalent technical definitions.

Mr. SHACKLEFORD.—In addition to the witness reading it, if the Court please, I desire to offer that portion of the book in evidence and ask leave to have it transcribed by the reporter exactly as it stands.

Mr. J. HELLENTHAL.—No objection.

The COURT.—It may be so transcribed.

Q. (By Mr. SHACKLEFORD.) Now, Mr. Wollenberg, in this particular instance in controversy, what is the power factor involved?

A. Under the present operating conditions the power factor of our circuit is at the time I determined it—was at the time I last determined it 70 per cent. As the conditions are not changing very much that is probably a nearly constant average.

(Testimony of H. L. Wollenberg.)

Q. Now, assuming the power factor to be 70 per cent, what amperage would you be entitled to at the Treadwell switch-board at their Sheep Creek property?

A. Assuming the power factor to be 70 per cent and 300 horse-power to be delivered— [232—165]

Q. Yes.

A. —at 2,300 volts as the voltage of delivery the necessary amperes would be 80.5.

Q. That is somewhere near as you can estimate—that is somewhere near in the neighborhood of the original setting of this ampere reading?

A. We were able to draw 80 amperes at the original setting. The setting must have been you know above that.

Q. Now, if the power factor is 70 and you were getting 80 amperes, would you obtain from the Treadwell line at their plant any more power than you would if the power factor was unity and you received 56 amperes?

A. No more power. In each case you would receive exactly 300 horse-power.

Q. Now, if your power factor was seventy—not unity—and you secured 56 amperes of current, what actual horse-power, would you be receiving from the Sheep Creek power plant?

A. If the power factor is 70 and we were receiving 56 amperes we would actually receive 210 horse-power.

Q. (By the COURT.) That is assuming that the voltage is the same?

(Testimony of H. L. Wollenberg.)

A. That is assuming that the voltage is the same; yes.

Q. (By Mr. SHACKLEFORD.) All these questions assume the voltage to be 2,300 volts?

A. Yes.

Q. That is the condition—the condition stated in the last question is the condition which now exists, Mr. Wollenberg, isn't it?

A. It is exactly the condition that now exists.

Q. Now, I wish you would make it clear to the record in this case—to the Court—what becomes of that extra 90 horse-power—do you get it, or does it go into the [233—166] surplus power of the defendant companies?

A. It goes into the surplus power of the defendant companies and is utilized by them in their operations.

Q. Now, Mr. Wollenberg, I wish you would refer to those authorities as you have at hand and explain to the Court what is the recognized usage at the present time with reference to continuity of current and with reference to the use of time relay circuit-breakers?

A. Well, I would like to read from page 956 of Foster's Electrical Hand-Book under the paragraph heading "Protective Relays," the general subject being switch boards. "Time element feature" is the paragraph heading—reads as follows: "Continuity of service is an essential consideration in all installations, and interruptions of the service cannot be tolerated unless the protection of the apparatus

(Testimony of H. L. Wollenberg.)

demands it. There are, however, certain abnormal conditions of current flow which may exist for a short time on a circuit without causing serious damage, such as swinging grounds, intermittent short circuits, synchronizing cross-currents, etc. The simply instantaneous relay would in such cases act instantly and interrupt the service unnecessarily. There has, therefore, arisen the necessity for relays having a retarded or time element action." Then reading the representative practice in switchboards, I would like to read from page 959 under the subject "Protection of alternating current systems. Generator circuit protection. Representative practice recommends the placing on generator circuits of either a reverse current relay, with [234—167] a time element feature, or else the entire elimination of automatic protection. FEEDER CIRCUIT PROTECTION. For feeders at the power station and, overload inverse time element relays are desirable. For feeders at the sub-station end, overload and reverse current inverse time element relays are desirable."

Q. Now, Mr. Wollenberg, I wish you would explain—there has been some talk here—that book that you have just been reading from is the same book that Mr. Hellenthal was referring to yesterday—one of the authorities on cross-examination of Mr. Thane read portions into the record.

A. It is another copy of the same work.

Q. (By the COURT.) What year—edition?

A. This is the fifth edition of 1908.

(Testimony of H. L. Wollenberg.)

Q. (By Mr. SHACKLEFORD.) I wish you would—there has been a good deal said by the defendants in this case about the danger to them of using a time relay circuit-breaker—I wish you would explain to the Court the practical situation with reference to the use of time relay circuit-breakers and the danger to them as compared from such an operation—as compared to any other ordinary operation, through short circuit.

A. The time limit circuit-breaker, such as we have been speaking of all this time, has been what is known as an inverse time relay—the feature of it is that for a given setting it does not open the circuit unless that amperage is exceeded for a certain period of time; but the period of time which elapses, as a function, is dependent on the [235—168] intensity of the overload and a circuit-breaker—the inverse time relay circuit-breaker will open instantly on a dead short circuit and it will be affected in a variety of ways by the and the rating for which it is set. But, as I just read from Foster, the time relay has been devised to furnish protection to the generating apparatus and at the same time avoid unnecessary interruptions of the service on the feeder line.

Q. A dead short circuit, however, would open the switch even if the time relay were on?

A. It would, if it were an inverse time relay switch.

Q. Well, now, if that is the case, if opened instantaneously on a dead short, would their lines be ade-

(Testimony of H. L. Wollenberg.)

quately protected?

A. Absolutely protected. The situation of our load on this line is in no wise different from the situation of any of their own power consumption. From the same bus-bars to which our feeder lines are attached their feeder lines leave through a time relay switch, and their operator informed me that that time relay switch is set at 500 amperes and that is the switch which furnishes protection to their generating apparatus from their own system.

Q. Now, referring to—there may be some doubt as to the situation with reference to the starting of these plants by the gas plant, that is, I don't know as the testimony is exactly clear—I wish you would explain to the Judge just how we are able to start the Perseverance machinery from the gas plant if we are unable to keep it up and if we are—if we have been unable to use it in making further connection with the defendant companies by way of a flying-switch? [236—169]

A. Well, the situation is this—that gas plant develops in the neighborhood of 200 horse-power. It can at any time be started—brought up to full speed—and the motor at the Perseverance can be started on it. After starting the motor on it, the compressor can be allowed to compress air and build up a load and it will carry that load a short period. We carried it for a period of an hour and a half or so and at the end of such time the overheating of the apparatus was such that we couldn't carry it any further. We are thus able to start the Perseverance

(Testimony of H. L. Wollenberg.)

motor and compressor and run it under load but not continuously, owing to the inadequacy of the gas engine plant.

Q. Now, I wish you would explain as to what is meant by the statement that you can start a motor by hand so far as its practical bearing on the ability to use a motor is concerned.

A. Well, you can turn a motor over by hand and in that way—

Q. That is without any load?

A. That is without any load; yes. The compressor being relieved, being unloaded, but you couldn't bring up to speed by hand and then throw it on a circuit because its speed is some six hundred revolutions.

Q. Now, I think the only other point—

A. Just a moment; you asked me about the flying-switch.

Q. Go ahead.

A. Well, having demonstrated that although able to start the Perseverance motor and compressor and able to [237—170] run it without a load for a short period, you can not carry that load. We attempted to start the motor—of course, it is belted to the compressor, but the compressor is unloaded at the time it is started. We attempted to get that into its full motion with a gas engine plant started without any load on a compressor—under the friction ground we would have time then to make a flying-switch on to the Treadwell line, but in each case that we did that apparently the cessation of one current and the lowering it or another caused a surge sufficient to

(Testimony of H. L. Wollenberg.)

throw the circuit-breaker out. We expected to be able to make that flying-switch and tried it a number of times, but at each time there occurred a surge that was sufficient to throw the circuit-breaker out.

Q. Now, Mr. Wollenberg, I wish you would explain to the Court what is the only known method of measuring power where horse-power is called for, or kilowatts.

A. I would like to quote in answer to that from page 69 of Foster, under the paragraph heading, "MEASUREMENT OF POWER UNDER ALTERNATING CURRENT CIRCUITS. In alternating current circuits having inductants in any part of the circuit, such as motors, unloaded transformers, and the inductants of the line itself, the product of the values of the current and the E. M. F. as shown by an ammeter and voltmeter does not give the power in the circuit, since the current is not in phase with the E. M. F." By way of explanation, the E. M. F. is the same as voltage. In alternating current circuits having inductance [238—171] in any part of the circuit, such as motors, unloaded transformers, or inductance of the line itself, the product of the values of the current and the E. M. F. as shown by an ammeter and voltmeter does not give the power in a circuit since the power is not in phase with the E. M. F.

Q. Now, that method of computation which is contained in that paragraph is the exact method which is used by the defendant companies in setting their circuit-breakers and their allowance of power to the plaintiff?

(Testimony of H. L. Wollenberg.)

A. It is the exact method that they propose. Now, this paragraph contains and gives the general formula that the power in alternating circuits is equal to the voltage times amperage times the power factor, and, in case of three phase circuits, times the square root of 3. That, of course, is accepted. Now, as regards the—that is, so to speak, is the theory by which the power is measured. That is the—that is the reason. Now, the actual measurement of power is covered in another paragraph that I would like to read.

Q. Very well, proceed.

A. Concerning wattmeters.

Q. (By Mr. S. HELLENTHAL.) What page is that on, Mr. Wollenberg?

A. Just a minute. It is on page 72 of Foster, called “WATTMETER METHODS.” It says, “For measurement of power in electric circuits the wattmeter gives the quickest and most accurate results. Since the instrument mechanically integrates the products of the instantaneous values of current and E. M. F., the power is indicated directly, regardless of the [239—172] power factor.” If you accept the truth of the general statement for power in alternating current circuits, that is to say, if you accept the truth, that cannot be contested that it is measured by the product of amperes times the volts times the power factor. It is clearly impossible to measure them by any device which does not—which is not influenced by all these things, and the wattmeter is the device with which to do this, “since the

(Testimony of H. L. Wollenberg.)

instrument mechanically integrates the product of the instantaneous values of current and the E. M. F., the power is indicated directly, regardless of the power factor."

Q. Now, then, the only other thing that I can think of, that is—probably some question about the use of the synchronous motor—do you know of any synchronous motor in this mining district or within a thousand miles from here?

A. I know of none in use.

Q. Now, the defendant companies have a number of motors in use, haven't they? A. A lot of them.

Q. Do you know of them having a synchronized motor in use? A. Not in use, I know of none.

Q. Do you know any common use of synchronized motors in ordinary mining operations of the power and character that we are using, considering the amount of power that is being drawn?

A. No, I do not.

Q. I want—I wish you would explain to the Judge what the practice—what the use of synchronized motors is [240—173] with reference to aiding the generator and what the practical explanation would be with reference to that.

A. Under alternating current circuits the power factor does not represent a loss of power to the generator but does represent a decrease in available capacity of the generator for producing power. Now, if a man is installing a generating plant and wishes at that generating plant to produce a thousand kilowatts in actual power, and if he at the time

(Testimony of H. L. Wollenberg.)

he is installing that generating plant realizes the fact that the load which he will put upon that generating plant will consist largely of inductive motors and other apparatus which inherently have a power factor, he will take that into consideration in buying his generator. For example: The Treadwell Company in installing a generator at Sheep Creek appreciated the fact that their motor loads and other loads would have a power factor. They anticipated that that power factor would be 85 per cent. They, therefore, buy a generator which could produce 100 kilowatts in current.

Q. (By Mr. J. HELLENTHAL.) Just a moment, Mr. Wollenberg. Are you testifying from information or things that you know?

A. I am testifying as to what—

Mr. SHACKLEFORD.—Just a moment. I believe that, if your Honor please, the gentleman has an opportunity to cross-examine; the witness has qualified and I am asking him this question.

Mr. J. HELLENTHAL.—Not qualified to talk about things he does not know anything about.
[241—174]

The COURT.—I think it is all right, by the way of illustration. It is your privilege to cross-examine the illustration as to how correct.

A. (By the WITNESS.) Anticipating that his power factor will be 85 per cent, he buys a machine which is capable of an output of 1,140 kilovolt-amperes—by that I mean to say when that machine is fully loaded the multiple of the amperes on the ma-

(Testimony of H. L. Wollenberg.)

chine by the volts will equal 1,140, whereas the real power will be 1,000. Now that machine, of course, is accompanied with certain guarantees as to the rise in temperature under safe loads and these guarantees will be then the safe temperature. Now, in case the owner of that machine should find that he has more water than is necessary to develop 1,000 kilowatts on that machine he could, by adding the water—always by adding more prime motive power—develop 1,140 kilowatts, or whatever that estimate is, if his load is unity power factor load because with a unity power factor load the number of amperes is less and the capacity of the generator is entirely controlled by the number of amperes it produces independent of the power factor. Now in addition to that, if the owner of the generating plant was also the owner of the transmission lines and all the system connected therewith, he suffers losses on his transmission lines and losses and disturbances in regulation through having a lower power factor. Therefore, if he himself is the owner of the generating plant it would be to his advantage [242—175] to use any device available for increasing the power factor of his system, especially if he has more prime motive force in the way of water, or whatever drives his generator, so he can use the increased capacity of such generator, and he is also a gainer by the reduction of the losses on his transmission line. Now, where the generator is owned by one party and he sells power to another party and the transmission line belongs to the owner of the generator, in other words, the ordi-

(Testimony of H. L. Wollenberg.)

nary power situation—in that instance it is the power company who tries to derive benefits from the raising of the power factor, and they derive benefit to such an extent that it is not uncommon for a power company to place a synchronous motor running in such a way that it acts to raise the power factor on the line at its own expense because the benefit is entirely to the owners of the generating plant and not to the owners of the consuming plant. Now, in the case of a mining company, it would make no difference whether a mining company is generating their own power or buying it—if a mining company were buying power, electric power, on any ordinary basis, such as wattmeter measurement of some sort, they would have no advantage—they would have no advantage and would not ordinarily install a synchronous motor for any of their work, for the reason that the synchronous motor is very much more expensive, is a very delicate machine to operate, and there are no advantages particularly given to them by the operation. [243—176]

Q. The use of the inductive motor as distinguished from the synchronous motor, however, does not mean a loss of power, does it, Mr. Wollenberg?

A. No, it does not.

Q. The use of a synchronous motor means that under certain conditions machines capable of a certain production may have their amperage increased, that is, the generating plant?

A. The generating plant, exactly.

Q. I think there was—there was some sections in

(Testimony of H. L. Wollenberg.)

that Foster shown yesterday to Mr. Thane—I wish you would explain the application of those rules to the Court.

A. Yes. I think that the rule referred to is No. 74a, on page 506.

Q. Of Foster?

A. Of Foster. Shall I read the rule?

Q. Yes, go ahead and read it and then explain it.

A. Now, this rule occurs in the extract of standardized rules of the America Institute under the chapter headed “PERFORMANCE SPECIFICATIONS AND TESTS,” and under the sub-heading of “Rating,” paragraph “74a. POWER FACTOR. Alternating current apparatus should be rated in kilowatts, at one hundred per cent power factor; that is, with current in phase with terminal voltage, unless a phase displacement is inherent in the apparatus, or is specified. If a power factor other than one hundred per cent. is specified, the rating should be expressed in kilovolt-amperes and power factor, at rated load.” Now the significance of that chapter is this, first of all it applies to the rating of machines—in no sense [244—177] to the measurement of the power. It applies to a standardization of the manufacturer’s practice in rating machines which he offers for sale. It covers the situation that where a generator is built and we will say it is a small sized generator—built just to be put in stock and sold to some man who comes along and wants it—now, at the time that generator is built it is not known whether it will be used on systems consisting of elec-

(Testimony of H. L. Wollenberg.)

tric lights or motors or anything else, therefore, at the time it is built no power factor can be anticipated on the line upon which it is to be run, therefore the American Institute adopt a standard rule that they will rate a machine at 100 per cent power factor and rate it in kilovolt-amperes if any power factor is specified. Now, the significant thing is they will not rate it in kilowatts if it is to be used on a load where power factor is inherent in the amperage—and the difference of kilowatts and kilovolt-amperes is just a difference between the true power and the apparent power.

Q. Now, Mr. Wollenberg, if a properly adjusted wattmeter were set in the connection of the defendants' power line with the power line of plaintiff at Sheep Creek power-house, would you be able to tell, providing that was a correct meter, what power you were actually taking at that place?

A. You would.

Q. That is, it wouldn't relate to power received anywhere else—it would measure the power actually received at that point? A. It would. [245—178].

Q. Do you know of any other way of measuring that power?

A. No, I do not know of any other practical way of measuring that power.

Q. Do you know of any way in which the use and enjoyment of a current of 300 horse-power can be secured without the use of a wattmeter and without the use of a sufficient surge to start the ordinary machinery on the line so as to give it a consumption of

(Testimony of H. L. Wollenberg.)

300 horse-power?

A. The machinery now on the line?

Q. Yes, sir? A. I do not.

Q. Outside of the defendant companies' installing a separate generator of a capacity of 300 horse-power, do you know of any way at present of the defendant companies giving to the plaintiff an uninterrupted current—outside of the installation of an uninterrupted current of exactly 300 horse-power—outside of the installation by the defendant companies of a separate generator?

A. I know no device that would do it.

Q. That device would accomplish that purpose?

A. What device do you mean?

A. A separate generator of an actual capacity of 300 horse-power?

A. Yes, a separate generator would accomplish the purpose.

Q. Otherwise no practical benefit of the current—of the use of the current described in the complaint can be [246—179] derived with the ordinary machinery on that line except by the use of a starting surge? A. That is correct.

Q. O, I will ask you, Mr. Wollenberg, so that it is stated to the Court—set aside for a moment the idea of forcing the defendants to give a continuous or uninterrupted current by a separate generator—I will ask you to state to the Court what would be necessary as a practical matter in electrical operations to give a practical and beneficial use of the power contracted for—in the way of apparatus at the

(Testimony of H. L. Wollenberg.)

connection of the plaintiff with the defendant companies?

A. The only practical way that I see that they can give the equivalent of an uninterrupted current is to place on their feeder line a circuit-breaker set for the protection of our generating apparatus but not set for the instantaneous breaking of our circuit. It—they could then place a curve-reading wattmeter on the circuit which would indicate not only all the instantaneous amount of power going over their line but the summation of those and the total power on the line—give a complete record; and then if the plaintiff company exceeds its 300 horse-power and such was indicated by the wattmeter, if they exceeded it for any length of time, the circuit-breaker might be used as a means of notifying them that they were exceeding it, but such circuit-breaker, if one be used at all, should have a time element factor which would allow the starting of the machinery to consume the power after it is running.

Q. While it is impracticable for a man to sit and observe [247—180] a wattmeter, it would be very easy to adopt a system of taking readings at whatever intervals the defendant companies desired for their own protection against any practical inroads on their power, wouldn't it? A. Exactly.

Q. Just describe to the Court, Mr. Wollenberg, what your practice would be in arriving at the proper setting on such a circuit-breaker.

The COURT.—That is to give 300 horse-power, I suppose?

(Testimony of H. L. Wollenberg.)

Mr. SHACKLEFORD.—Yes, to give an uninterrupted—

A. You mean, do you not, to give a power which under the circumstances is a practical equivalent of an uninterrupted current of 300 horse-power?

Q. Yes.

A. Well, I should say that that circuit-breaker should be set, by an observation upon an ammeter and a wattmeter at times when the load was at 300 horse-power or its equivalent, and that would give the amperes necessary to give 300 horse-power, and by doing this a continuous power factor would be provided—be nearly enough constant, so by making a number of such determinations you could get the average amperage necessary or the maximum amperage necessary for delivering 300 horse-power, and then could take and set the circuit-breaker according to it by actual readings on the panel controlling the feeder.

Q. Well, if such a practice as that was adopted, Mr. Wollenberg, the results on the average would be that [248—181] we would draw less than 300 horse-power, wouldn't it?

A. Yes. I know of no way that we could load that line right up to the limit continuously.

Q. And that margin of safety which is necessary to hold below the 300 horse-power would be a margin that would amply compensate for any surge such as you may consider absolutely necessary for a starting surge? A. Very much more than compensate.

Mr. SHACKLEFORD.—That is all.

(Testimony of H. L. Wollenberg.)

Q. (By the COURT.) What margin is necessary for safety—what margin do you refer to?

Q. (By Mr. SHACKLEFORD.) I will ask the witness a further question. I referred, Mr. Wollenberg, to the margin which you must necessarily in your operations allow so as to keep below the 300 horse-power? A. Well, your Honor,—

Q. Just explain that.

A. We would put such motors on that machine that their normal rating at their normal load would not overdraw that amount. Well, now, in any operation there are many times during the day and frequently longer period when these different machines are not on the line at all. Whatever machines we put on that line we would have to put at their maximum, but under the 300 horse-power. Now, there would be a good many times during the day when we will have a light load on that 300 horse-power—would be a good many hours during the day when that load would be off the line. Now, as I explained before, we would only see what that load calls for and everything that we don't receive is on their bus-bars, which puts it on their [249—182] system—which puts it into use at their property.

Cross-examination.

Q. (By Mr. J. HELLENTHAL.) Well, Mr. Wollenberg, where did you ever see any such scheme for the measurement of power installed that you have been urging here—did you ever see anybody measure power that way? A. With a wattmeter?

Q. With a wattmeter and by setting an ammeter

(Testimony of H. L. Wollenberg.)

or by putting it in and out and doing as you say you have?

A. I have never seen power measured in any other way than with a wattmeter.

Q. Where have you ever seen it measured in the way you have here indicated?

A. Mr. Hellenthal, I indicated only that it would be measured by the wattmeter because a circuit-breaker does not measure power.

Q. Did you ever see anyone install a wattmeter and install a circuit-breaker and change it up and down as you have indicated it, up and down?

A. I have not.

Q. Now, Mr. Wollenberg, a generator generates amperes and voltage; is that not true?

A. It generates a current which has those characteristics.

Q. Amperage and voltage?

A. Those are functions of the current which it generates.

Q. Amperage and voltage—a watt is a unit of electric power? A. It is.

Q. A watt is a volt times an ampere, is it not? [250—183] A. Only the direct measurement.

Q. Now, Mr. Wollenberg, we will get to that pretty soon—a watt is a volt times an ampere, is it not, when not considering power factor?

A. It is in case of direct currents.

Q. All right, have it that way. A watt is a volt times an ampere?

A. In case of direct currents it is.

(Testimony of H. L. Wollenberg.)

Q. Mr. Wollenberg, is it not in case of an indirect current? A. You mean an alternating current?

Q. Alternating current?

A. It is in case of alternating currents, it is equal to a volt times the ampere times the power factor and certain constants which the phase of the currents—

Q. Now, listen. A generating plant generates volts and amperes, nothing else; isn't that true?

A. Quite true.

Q. Volts and amperes together with to a certain extent undeveloped power, do they not—power in the potential, is that not true?

A. I don't know of any such thing as power in potential.

Q. You know of such a thing as power undeveloped?

A. Yes, water running down a hill is undeveloped power.

Q. How about an electric current flowing in the wire, is that undeveloped power? A. It is not.

Q. What is it—developed power? [251—184]

A. It is a current, only flows through that line in accordance with its consumption, either through loads or resistance on that wire and loads attached to that wire. There isn't such a thing as putting a bunch of amperes and volts out on the end of a wire and considering it so much undeveloped power.

Q. Volts and amperes—amperes impressed with a certain voltage on the bus-bar, you mean to tell me now, is not undeveloped power? A. I do, yes.

(Testimony of H. L. Wollenberg.)

Q. What is it?

A. It is—it represents power that is being consumed somewhere else in that circuit, it is not being stored and if the generator was producing so many amperes of such and such a voltage that that current is being absorbed somewhere else.

Q. Why certainly?

A. It cannot be held at a point, as you mention it, as a potential power.

Q. At the instant now on the generation of volts and amperes are not these volts and amperes undeveloped power? A. They are not.

Q. What are they—are they developed power?

A. They represent the volts and amperes, represent the measurement of a current; the measurement of a current.

Q. Exactly?

A. Those are those two functions—those volts and [252—185] amperes in a case of alternating current times power factor, but in the simple case of direct current it represents a current which is being used up which is phase times volts; volts and amperes.

Q. How can you say it is being used up, it isn't necessarily being used in horse-power. It may flow off into the ground?

A. Then it is being converted into heat, which is a definite equivalent of horse-power. The energy is in some form.

Q. The energy is not converted into power but simply passes through the wire; is that not true?

A. Well, put your question.

(Testimony of H. L. Wollenberg.)

Q. In case your current running off a wire into the ground that current passes through the wire notwithstanding the fact that it is not being developed into horse-power, does it not? A. Yes.

Q. What is that current if it isn't undeveloped power? A. It is power.

Q. It is power? A. Yes; it is power.

Q. But it isn't developed into horse-power, it is?

A. Certainly it is developed into an equivalent of horse-power, which is heat. Understand, Mr. Hellenthal, in the case you have mentioned, the ground simply completes the—the ground completes the circuit and it has a resistance loss in there which is converted into heat. You can't have an electric—an electric circuit is a circuit, must be complete, and along that circuit are necessary conversions [253—186] into power which consume the current, that is consume the energy of the current.

Q. All right. Well, now, when you install a motor you develop the electric current produced at your generating plant into horse-power, do you not?

A. You do.

Q. The electric current produced at the generator is not developed into horse-power until you install your motors and use it for that purpose, is it?

A. No, it—no, it isn't.

Q. Then until it is developed it is undeveloped, isn't it?

A. It is not produced until it is developed. It isn't produced until—

Q. A generator that runs—

(Testimony of H. L. Wollenberg.)

A. A generator can run if it has a closed circuit and it doesn't make any difference where that circuit is, whether the motors or any other resistance on it which has a power consumption, if you run a motor—without closing the circuit somewhere you don't generate any current.

Q. All right. In taking your current—in generating your current and taking it off your wires to utilize it in your motor and developing it into horsepower, there is a certain loss, Mr. Wollenberg, I understand? A. There is.

Q. And that loss is quite a power factor?

A. It is not.

Q. What is it called?

A. It is called the—it is the summation of a number [254—187] of losses, transformer losses, light losses, motor deficiency losses—

Q. I am not speaking of line losses—leave those out.

A. All right; there is motor deficiency loss.

Q. Well, leave that out.

A. Well, if you leave all the losses out you haven't any losses left.

Q. You mean to tell me that a motor can develop the same horse-power that is developed at the generator? A. No.

Q. No?

A. No. But you said to leave out line losses and motor deficiency losses.

Q. Leave out line losses, transformer losses and motor deficiency losses; then, can you operate the

(Testimony of H. L. Wollenberg.)

same power as the generator?

A. Leaving out all losses between the generator and the motor, assuming that no losses exist between the generator and the motor, there are no losses. That is an answer to your question.

Q. If there are no losses, there are no losses. That is not what I am trying to get at.

A. I know, you are trying to make me admit that power factor is a deficiency loss.

Q. No, I am not asking you—

A. That is what you are trying to get.

The COURT.—Evidently a misunderstanding.

Q. (By Mr. J. HELLENTHAL.) Isn't power factor the difference between the power generated and the power utilized or developed?

A. It is not. [225—188]

Q. Now, what is a power factor?

A. The power factor—

Q. Never mind about your book?

A. —the power factor is the ratio between the real power and the apparent.

Q. Well, now, I will change that wording—is it—the power factor is the ratio between the power produced at the generating plant and the power developed or utilized?

A. It is not. It is the ratio between the real power developed at the generating plant and the apparent power indicated at your generating plant by your ammeter and voltmeter readings.

Q. Now, what do you mean by apparent power?

A. I mean by apparent power the power that

(Testimony of H. L. Wollenberg.)

would be obtained by a simple multiplication of the readings of the indicating instrument, indicating ammeters and voltmeters.

Q. What do you mean by apparent power, actual developed power, and by real power—the useful power that can be obtained? A. Absolutely not.

Q. Now, what do you mean by real power?

A. I mean the power available for the performance of useful work—real power.

Q. Yes—power available for the performance of useful work? A. Yes.

Q. By apparent power, what do you mean?

A. I mean by apparent power that apparently is available by the reading of the indicating ammeter and voltmeter. [256—189]

Q. You mean by apparent power the power that apparently is available for the performance of useful work, and by real power the power that is actually available; isn't that true?

A. Yes; but I will correct it to a certain extent; real power is the power actually being consumed, not only available, but actually being consumed.

Q. Actually being produced?

A. Actually being consumed.

Q. By consumed you mean produced?

A. Do not. I mean by consumed, consumed. It is a simple English word.

Q. Quite so. When you say consumed do you mean to say that the power consumed is the same as the power produced? A. Absolutely.

Q. Absolutely?

(Testimony of H. L. Wollenberg.)

A. Absolutely. Using it by consumption in line losses, motor losses, or anything else. The fundamental principle of conservation of energy answers your question. The power consumed is equal to the power produced.

Q. Now, power produced or capable of being produced from a given number of amperes at a fixed or given voltage depends upon the manner and means in which it is consumed, does it not, Mr. Wollenberg?

A. No, it depends rather on the—on the question of whether they are in phase with each other—if the amperes and volts being produced are in phase with each other; in other words, if the current has unity [257—190] power factor they will produce a certain amount of current; if those amperes and volts being produced are not in phase with each other,—in other words, if not unity power factor but something else, they will produce a less amount of power. Now, understand, Mr. Hellenthal, a generator does not produce an ampere, or a certain voltage—with a certain voltage until the circuit is closed and some call comes on that generator to take that current. Now, if the call on that generator is for an inductive load, that generator produces an ampere which is not in phase with the voltage; and if a call comes on the generator from a system of unity power factor, then that generator produces a current in which the amperes and the volts are in phase with each other.

Q. Now, let's get back to where we were talking about.

A. The generator does not of itself produce am-

(Testimony of H. L. Wollenberg.)

peres which are in phase with the voltage unless the load that calls upon that generator is that ordinarily required in that kind of current, it doesn't produce it and then become converted, but the motor in producing it—it conforms—the motor—is the system—it is a circuit—the conditions that prevail are influenced by everything on that circuit. There isn't a distinct power factor at a certain place on the generator and taken from that place by the motor—it is a circuit.

Q. All right. Let's get back to where we were talking. We will just put it this way so you understand just what we mean, Mr. Wollenberg. The power factor in [258—191] any given case depends upon the use to which the power or the electricity is applied, does it not? A. That is true.

Q. That is true. In case of a form K motor such as you are using at Sheep Creek, there is a certain power factor, is there not?

Q. You mean a certain common constant power factor?

Q. No, it isn't constant?

A. It has a power factor. It is inherent in that make of machine.

Q. It has a power factor inherent in that make of machine? A. Yes.

Q. The power factor in one form K motor only differs probably from the power factor in other form K motors slightly?

A. Slightly. Well, the power factor in any one machine differs a little whether the machine is fully

(Testimony of H. L. Wollenberg.)

loaded or partly loaded.

Q. The power factor in the machine varies at different hours even during the day and evening, different moments, depending on the load placed upon the machine? A. Exactly.

Q. When the machine is loaded heavily the power factor is light, when the power factor is—

A. The machine has its highest power factor at its normal rating. If a 200 horse-power motor it has its highest power factor when producing 200 horse-power, and at less loads and overloads it falls off.

Q. The power factor gets less?

A. Yes. [259—192]

Q. Machines will not often run just at their normal rating but will run either above or below that in actual practice? A. In actual practice; yes.

Q. In actual practice the power factor on a machine varies every moment during the day as the load on the machine increases or decreases?

A. If it has a varied load, that is true.

Q. Again, the power factor inherent in different forms of motors also varies, does it not, Mr. Wollenberg? A. It does.

Q. The power factor inherent in a form M or form P motor is very different from the power factor inherent in a form K motor? A. No.

Q. How much difference?

A. Why, of course, it is a hard question to answer, because a form K motor of different size will vary some in their power factors, but ordinarily the best makes of inductive motors are about 85 per cent

(Testimony of H. L. Wollenberg.)

power factor at their—at and around their normal rating, and a form M and form P and form K are all inductive motors and different at the starting place and rather than in any material difference after they are operating.

Q. Now, your form K motor you are now operating has about 70 per cent power factor?

A. No, the whole system which we are now operating has about 70 per cent power factor.

Q. This includes the lighting?

A. Includes the lights. [260—193]

Q. The lights on the plant however would not have any power factor at all?

A. Yes, they have unity power factor.

Q. Unity power factor? A. Yes.

Q. Well, that is 100 per cent power factor?

A. Yes, but it is a power factor just the same.

Q. So your lights and your motor being on the line, you have no other load on the line?

A. Well, the lights themselves have an inductive effect and transformers have an inductive effect, all of which lowers the power factor.

Q. All of which lowers the power factor?

A. I mean lowers it below unity; they all have power factor.

Q. You do not consider that the line losses and transformer losses enter into the power factor, do you? A. Yes, I do.

Q. Well, those losses—

A. I don't mean the transformer—if I understand

(Testimony of H. L. Wollenberg.)

your question: do the transformers influence the power factor?

Q. Yes. A. They do very materially.

Q. They do influence the motor power? Then the question of whether you have one or two transformers on your line would either increase or decrease the power factor? A. It would.

Q. The more transformers you have on your line the less would be the power factor?

A. No, that isn't true. The power factor of transformers [261—194] varies considerably according to their loading and at high loads—at full loads their power factor is high and at low loads it is low. So it is a very big question.

Q. It is a question as to what the power factor would be.

A. That question with reference to transformers.

Q. Yet they would affect the power factor, is that true? A. Yes.

Q. It is quite a mooted question as to how your transformers will affect the power factor?

A. Oh, no; no doubt about it at all. It is an established fact that transformers affect power factor, but I say the effect—as to what their effect is depends upon the load on it, so to speak, it varies just the same as the motors do.

Q. The effect of the transformers upon the power factor would also depend on the number of transformers in use? A. Yes.

Q. The greater the number of transformers in use the greater the effect? A. Yes.

(Testimony of H. L. Wollenberg.)

Q. Again, you say the power factor is also affected by your line? A. Yes.

Q. How does that affect it?

A. How does that affect it?

Q. How does it occur?

A. Well, it occurs from the line of itself having a certain inductive capacity and it would be a function in the line. [262—195]

Q. The longer the line the greater the effect upon the power factor? A. Correct.

Q. How does the length of line affect the power factor, Mr. Wollenberg?

A. The greater length of line—

Q. The greater power factor?

A. No, the less.

Q. The less the power factor. So the shorter your line your power factor would be greater, and as you lengthen out your power factor would be less; is that correct? A. That is correct.

Q. Those are all elements that enter into the determination of what the power factor should be in any given case? A. Yes.

Q. If you were to install a lighting plant the power factor would be unity?

A. Well, nearly so; would be transformers on that, probably, and line inductive effects that would bring it below unity.

Q. Well, leaving out the effect of the transformers? A. The load itself is unity.

Q. The same is true of a synchronous motor?

A. A synchronous motor would be operated to have

(Testimony of H. L. Wollenberg.)

a power factor of one and a half.

Q. Which is practical?

A. No, unity is uncommon. I say a synchronous motor can be—well, hardly at one and a half—but say above unity.

Q. Above unity?

A. A synchronous motor in operation is practically within [263—196] the control of the man running and is a power factor—

Q. The installation of a synchronous motor then puts the party operating it in such a position that he can get more than 100 per cent power factor?

A. Yes.

Q. Can you get more than 100 per cent useful power out of 100 per cent apparent power?

A. No.

Mr. SHACKLEFORD.—Just a moment. Repeat that.

Mr. J. HELLENTHAL.—I didn't mean to say he could—get more useful power than he has apparent power; that is what I mean.

A. If it was so arranged as to bring the power factor above unity, why I can get more useful power than apparent power. That is correct. I don't think that has much practical operation, but it could be done—it is correct; yes.

Q. Are there any other forms of motor in use to which—are there or are there not, Mr. Wollenberg, a large number of other forms of motors that can be used in connection with the development of horse-

(Testimony of H. L. Wollenberg.)

power other than those of which we have been speaking?

A. Yes; we have been speaking of the form K and form P and a lot of designations which are exclusively those of the General Electric Company. There are many other motors made by other concerns and differently designated but of the same type. [264—197]

Q. All of these various motors—any number of motors—each motor has its own power factor when installed and operating, does it not? A. Yes.

Q. And the power factor in each one of these motors differs from the power factor in each other of the motors?

A. Well, two motors made by the same manufacturer while not the identical—built in the same manner will have the same characteristics, of course.

Q. But even at that they wouldn't have exactly the same power factor?

A. *The* would under the same conditions—two identical motors under identically the same conditions would have the same power factor.

Q. Do you know of any identical motors running?

A. Well, you know that if you are going to ask me foolish questions, that two things cannot exist in nature that are identical, but, if you are speaking in practical terms, two identical motors are very probable and continually built.

Q. Now, you say that the manner in which you measure this power at Sheep Creek would be by means of a wattmeter. A. I do.

(Testimony of H. L. Wollenberg.)

Q. Now, the wattmeter takes automatically into consideration the power factor, does it not?

A. It does.

Q. It shows you how much horse-power is actually developed from the current in use—that is what it does, doesn't it? [265—198]

A. Yes, actually consumed.

Q. In the case of a form K wattmeter—form K motor, the wattmeter would show the horse-power actually developed from a given current by that motor? A. In any case—

Q. The same in the case of any other kind of a motor, synchronous motor or any other?

A. Exactly; any kind of a motor, whatever that may be.

Q. If you were to install a synchronous motor—we will not develop the synchronous motor above the power factor but, say, operated at unity power factor, the wattmeter if installed at Sheep Creek, if it were to indicate 300 horse-power and then sent a man there—you were then to read. Let me get that question; I am getting it too involved. If we were to involve—if you were to install a synchronous motor—

A. Where?

Q. At Sheep Creek, we will say somewhere on that line of unity power factor that had a power factor and a wattmeter were installed to measure your power and you stood by and waited until the wattmeter read 300 horse-power and you then went to your ammeter to see how that read, the voltage being 2,300, the ammeter would read 56 amperes, would it

(Testimony of H. L. Wollenberg.)

not? A. That is correct.

Q. That is correct, is it not? A. That is correct.

Q. Then if you were operating the plant for the defendant companies and the Alaska-Perseverance Company, or the Gastineau Company, or whatever it is—the plaintiff company were operating with a synchronous motor, you [266—199] would then place your circuit-breaker at 56, would you not?

A. If I were operating the defendants' plant?

Q. Yes, and you were working it according to the method that you have been trying to tell us about?

A. Yes, I would place the time relay circuit-breaker at 56 amperes.

Q. You intend to put in a time relay circuit-breaker—your circuit-breaker, whatever circuit-breaker you might use you would place at 56 amperes?

A. If such circuit-breaker would open the circuit at 300 horse-power, if that is the limit, I would place it at 56 amperes under the conditions you have described.

Q. If the plaintiff company were using a light load and you were drawing 300 horse-power and you went to your wattmeter, you would find that the wattmeter when it read 300 horse-power or the equivalent in watts of 300 horse-power, it is 224, isn't it?

A. Yes.

Q. 224. You would then find that your ammeter would read 56, as in the case of a synchronous motor, wouldn't you?

A. Not unless all those lights were closed down at

(Testimony of H. L. Wollenberg.)

Sheep Creek in one place and right at the power plant—

Q. Well, assuming there are no line losses—

Mr. SHACKLEFORD.—Just a moment. I object to counsel interrupting the witness when he is starting to answer a question.

Mr. J. HELLENTHAL.—I object to counsel butting in.

The COURT.—Both objections sustained. [267—200]

A. (By the WITNESS.) The only way that the ammeter would read 56 would be that these lights were all down there at that power-house where they would be of no use to anybody, because if those lights were at any other useful place the power factor would be less than unity (56), because although the lighting itself has a power factor of unity the line and other factors necessary—transformers—would lower that power factor below unity. The only case that ammeter would read 56 in case 300 horse-power going over would be in the case of the lights right down there at the power-house and no line losses.

Q. (By Mr. HELLENTHAL.) We are assuming there is no line loss.

A. I am not speaking of line loss; there is the inductive factor of the line which lowers the power factor. There are two distinct things.

Q. All right, we will say that the lights were used at the power-house, at the place where the power is, here at the power-house, then the power factor would be unity, would it not?

(Testimony of H. L. Wollenberg.)

A. Well, if you can get a light to burn on 2,300 volts, you would have to put some transformers in to use that available light and that would probably affect the power factor.

Q. Assuming you could get a light to burn on 2,300 volts—

A. Assuming that you could get a light to burn on 2,300 volts and put the lights there in a cluster where no inductive effect on the power factor—the power factor would be unity.

Q. And then if your lights were so installed and you [268—201] could have that and the equivalent of 300 horse-power were being furnished from the bus-bars— A. Correct.

Q. —then you would set the circuit-breaker at 56?

A. That is set at 56 if it were the intention to have it open at 300 horse-power.

Q. Exactly. Now, suppose these lights are turned away from Sheep Creek and turned to Juneau, it would then not have unity power factor, would it?

A. No.

Q. The power factor would be something less than unity? A. It would.

Q. Then if 300—if the equivalent of 300 horse-power would be drawn from the line as indicated upon the wattmeter, you would find the ammeter something above 56, probably 58, 59 or 60?

A. I don't attempt to say what its amount would be—something above—

Q. O, no, but something above? A. Yes.

Q. You would then set your ammeter to correspond

(Testimony of H. L. Wollenberg.)

with that, or your circuit-breaker I mean, to correspond with that reading of the ammeter?

A. I would if I were attempting to set the circuit-breaker to open at 300 horse-power.

Q. 300 horse-power—and that 300 horse-power you would consume—is that correct?

A. That is correct.

Q. Then if the electric lighting current were transferred from Juneau to Skagway, the power factor would [269—202] be very much greater, would it not, the line being longer? A. You mean lower?

Q. Very much less, isn't that true?

A. Yes, that is correct.

Q. Then if you set that wattmeter in your power-house—found that your consumer was drawing an equivalent of 300 horse-power you would find that your ammeter would probably register 65 or 70, about where it did on the previous occasion, would you not?

A. Yes.

Q. Then you would readjust your circuit-breaker, of course, your purpose being to set your circuit-breaker so it would go out if more than 300 horse-power were drawn, you would then readjust your circuit-breaker to correspond with that reading of the ammeter? A. I would.

Q. Then if your consumer discontinued the power of the electric lights and went to using a form K motor, as you are now using at the Perseverance—cut out some electric lights so that the power factor would be again changed, you would again go to your wattmeter, find out whether the equivalent of 300

(Testimony of H. L. Wollenberg.)

horse-power was being drawn, wouldn't you?

A. Yes, I would.

Q. Then you would find that the amperage had increased materially, wouldn't you?

A. It would have, yes.

Q. Probably 80-odd amperes?

A. I would not venture an opinion on the subject.

[270—203]

Q. Well, I say, it would have increased?

A. It would have increased.

Q. You can't, of course, tell what it would be upon the power factor? A. I suppose it is.

Q. Mr. Wollenberg, you can't tell what it would be because the power factor would go up?

A. The conditions you have described—no, no; can't say what the power factor would be.

Q. No, of course you can't say what it would be, but it would be greater? A. Yes, certainly.

Q. I mean less? A. Less.

Q. Now, then, would you again readjust your circuit-breaker to correspond with the reading of your ammeter, which would on that occasion probably be 80 or some figure, would you not, Mr. Wollenberg?

A. Depending if the purpose were to get from the circuit-breaker—

Q. If more than 300 horse-power were drawn whenever your consumer would change the use to which his power was being put from one thing to another, whether it be from lighting to an inductive motor, from an inductive motor to a synchronous motor or from one motor to another form of motor,

(Testimony of H. L. Wollenberg.)

the power factor would change, would it not?

A. Yes, it would.

Q. And every time that the power factor would change you would go to your wattmeter and read your wattmeter, [271—204] determining whether he was taking 300 horse-power and read your ammeter to determine how much amperage was being consumed, and then set your circuit-breaker accordingly; is that it?

A. I would, if the purpose were to set the circuit-breaker, were to allow 300 horse-power on that surge.

Q. The amperage on that—assuming now that all these questions, Mr. Wollenberg, that the voltage remained the same? A. Yes.

Q. —no use of naming the voltage because it is always constant at Sheep Creek?

A. No; it is not.

Q. Supposed to be kept at a certain voltage?

A. But it is not.

Q. Well, as near as can be done?

A. Yes; the attempt is made but it varies materially.

Q. How much?

A. Well, I have seen charts down there on which a written record is made daily, which shows some peculiar variations in percentage.

Q. You don't know whether—that is, whether it goes below 2,300?

A. I could not say as to the exact amount, I only know that these charts which show the voltage allowed a consumer would show a straight line. If any

(Testimony of H. L. Wollenberg.)

variations come on the plant are inclined to go up and down.

Q. That is the case with every—

A. Practically; yes.

Q. Leaving that out and assuming a constant voltage, now we will assume it may be 2,300 or 2,400, the [272—205] amperage, that is to say, the flow of current would be increased or diminished each time that the use to which the power was applied was changed from one use to another, would it not?

A. If that use involves the use of a power factor it would.

Q. Exactly? A. It would.

Q. If the plaintiff company were using a synchronous motor at unity power factor, the amperage would be 56?

A. If such a synchronous motor were located at the Sheep Creek plant? Q. Yes.

A. —showing that no other inductive loads occurred?

Q. So that the power factor would be unity?

A. So that the power factor, not of the main circuit, but of that motor, should be unity.

Q. Now, if the use to which the power was applied switched to some motor or some other machine or whatever they would, that they had a power factor of 50 per cent, the amperage would be twice 56, or 120, would it not? A. It would.

Q. That is to say the actual quantity of electric current taken from the bus-bars would be double, would it not?

(Testimony of H. L. Wollenberg.)

A. What do you mean by amount of current?

Q. The actual amount of amperes and volts?

A. No, the actual amount of amperes taken would be doubled.

Q. The volts remaining the same? A. Yes.

[273—206]

Q. That is to say, the volts remaining the same, it would double the quantity of current, would it not?

A. What do you mean by quantity of current?

Q. Well, the volt times amperes?

A. Then you mean kilovolt-amperes?

Q. Kilovolt-amperes?

A. Yes, the number of kilovolt-amperes would be doubled, but the number of watts of real power would not be.

Q. No, that would remain the same?

A. Exactly.

Q. But the quantity of kilovolt-amperes would be doubled? A. It would.

Q. Now, kilovolt-amperes are what the generating plant generates; is that not true?

A. That is not true, as a general statement.

Q. Well, let's get at it this way. Suppose we have a generating plant, Mr. Wollenberg, that has a capacity of 56 amperes and a voltage of 2,300, such a generating plant would generate sufficient power to operate—to furnish you with 300 horse-power at unity power factor, would it not?

A. If you say—repeat your question, please.

Q. If you have a generating plant that will generate 56 amperes impressed with a voltage of 2,300

(Testimony of H. L. Wollenberg.)

such generating plant would generate sufficient power to furnish you with 300 horse-power at unity power factor? A. It would.

The COURT.—We will adjourn to two o'clock.
[274—207]

Two o'clock—Court reconvened.

The COURT.—You may proceed, gentlemen, with the case before the Court.

Q. (By Mr. J. HELLENTHAL.) Mr. Wollenberg, just before lunch I was asking you this question: If a generating plant had a capacity of 300 horse-power, assuming the power factor to be unity, you understand, you would take all the power generated at that plant if you drew 300 horse-power at a unity power, would you not?

A. You would.

Q. Then, if the power factor was decreased to 50 per cent you would take twice the power generated at a plant of that size before you would be getting 300 horse-power,—is that true? A. Absolutely not.

Q. Not true? A. Absolutely not true.

Q. Now, explain to me why that is not true.

A. In case of a generator capable of producing 300 horse-power and under the necessary motive power—prime motive power for the production of that unity horse-power if supplying current to a circuit of unity power factor, it will require a definite number of amperes at a definite voltage. In the event of that same generator with that same amount of motive power, that same amount of motive power of water, merely enough prime motive power to furnish 300

(Testimony of H. L. Wollenberg.)

horse-power, in the event of that generator with that same amount of motive power to supply current to a circuit of 50 per cent [275—208] power factor it would still supply exactly 300-horse power. With that circuit—although the readings of the meters on the line would show a different amperage than they would in the previous case, but the output of power we would generate from the prime motive system, whether it be water or anything else—and the output of that generator in real power, whether it be in a current of one hundred per cent power *favor* or any other power factor, the power involved remains the same.

Q. Now, I don't think you quite understood me. Where the consumer increases the amperage by a decrease in the power factor the tax on the generator increases does it not?

A. What do you mean by tax?

Q. Well, the demands made upon the generator.

A. The demand for power made upon the generator remains constant.

Q. Do you mean to say, Mr. Wollenberg, that a generator having a capacity, just a sufficient capacity to furnish the electric current that would be drawn from the bus-bars by a consumer drawing 300 horse-power under a unity power factor would furnish the power drawn by a consumer if the power factor were decreased to 50 per cent—yes or no—do you mean to say that?

A. If you want me to answer, yes or no, you will have to define some of the words you use, which you

(Testimony of H. L. Wollenberg.)

use rather roughly.

Q. What do you want?

A. First place, I want to know what you mean by the [276—209] capacity of a generator of 300 horse-power?

Q. That is all a generator can generate?

A. All the power it can generate?

Q. All the power it can generate.

A. You can't let a generator use all the power it will generate and state it has horse-power—

Q. All right, we will get together. When you measure a generator? A. When you measure it?

Q. When you speak of a generator having 100 horse-power.

A. Well, just a moment, if I may interrupt you. Generators are not rated that way.

Q. How is the Sheep Creek generator rated?

A. O, it is rated in watts at a constant power factor.

Q. All right, that is the equivalent of certain amperes at a certain voltage, is it not?

A. It is the equivalent of a certain amperage at a certain voltage, at a certain power factor—at a certain power factor.

Q. All right; well, now, we will say that the power factor is unity, we are assuming a specific kind of generator now, on which the power factor we are assuming now is unity, you understand? A. Yes.

Q. It produces 300 horse-power as a unity power factor, that is to say it generates 56—we are speaking of 300 instead of 100 in order to keep this matter before you—we are generating 56 amperes at present

(Testimony of H. L. Wollenberg.)

with a voltage of 2,300; is that not true?

A. I have lost your question now. [277—210]

Q. Well, we are assuming now that the Sheep Creek generator—is much larger—we will assume it only has a capacity to generate 300 horse-power at a unity power factor, that it to say, has the capacity to generate 56 amperes impressed with a voltage of 2,300—we assume that—

A. By capacity you mean that you are to be within safe temperatures under these conditions—is that what you mean by capacity?

Q. Exactly. If the tax upon it is increased the temperature will become too increased to make it safe—you understand me now? A. Yes.

Q. Then if we reduce the power factor to 50 per cent—then if we reduce the power factor to 50 per cent? A. Yes.

Q. You don't mean to say that that generator will still furnish 300 horse-power?

A. It would still furnish 300 horse-power, so far as the motive power—the prime motive power needed or energy needed, but would then have amperage on it which would overheat it if it were only a safe temperature.

Q. Well, we will say will it produce it without overheating, that is what I am trying to get at—is that within its capacity?

A. You are taking 50 per cent power factor?

Q. Yes. A. Well, it— [278—211]

Q. It doubles the amperage?

A. It doubles the amperage and increases the heat-

(Testimony of H. L. Wollenberg.)

ing of the generator. Now, whether the generator will stand it or not is just a question of the particular generator or the manufacturer's agreement.

Q. We are assuming now that we have a generator running at absolutely its full capacity—I mean generating 300 horse-power at unity power factor.

A. O!

Q. Then you cannot take that same generator and generate 300 horse-power at 50 per cent?

A. Not without overheating.

Q. Not without overheating? A. No.

Q. No. You are doubling the tax on it?

A. You are doubling the flow of amperage in the generator.

Q. Well, that doubles the tax upon the generator, does it not? The demand you are making, a double demand you are making on the generator, are you not? A. Not as regards power.

Q. Well, I understand that, but as regards voltage and amperes?

A. No, as regards voltage—as regards amperage you are making a larger demand upon the generator.

Q. Well, the generator has got to generate twice as much, does it not, in the way of voltage and amperage?

A. No, not in the way of voltage and amperage.

Q. Well, the voltage remains the same but the amperage [279—212] has got to be doubled?

A. The amperage has got to be doubled.

Q. Yes. Now—assuming now, Mr. Wollenberg, that the Treadwell Company—the defendant com-

(Testimony of H. L. Wollenberg.)

panies here should install at Sheep Creek a proper motor for your use— A. You mean generator?

Q. —a proper generator having a capacity to generate 300 horse-power at unity power—having no greater capacity—you know what I mean by capacity—now that is the current you will produce?

A. Yes, with a safe temperature.

Q. Then it wont go anything higher, that is to say it will go if it goes any higher than that, it will burn it out. Now, you know what I am getting at—if it runs faster it will burn out?

A. It is not a question of running it faster.

Q. Well, if you make any greater demand upon it, understand it now?

A. Yes, it isn't a practical question.

Q. I don't care whether practical or not, answer my question. A. I will tell you—

Q. Now, if they installed such a generator and you reduced your power factor to 50 per cent the generator would be too small, wouldn't it?

A. It would.

Q. Yes. Now, if they installed a generator that would furnish you with the required amount of horse-power at 70 per cent, that would be the limit of its capacity at 70 per cent power factor, providing you [280—213] are now using it there to reduce it to 50 per cent—your generator would be too small, would it not—reducing it to anything below 70 per cent?

A. If previously taken just equal to that, it would be too small.

Q. Yes, then again, if you install this generator

(Testimony of H. L. Wollenberg.)

at 70 per cent and instead of reducing your factor to 50 or 60 you increased it to 90, we will say, the generator then would have a surplus of power, it would be capable of producing a surplus of power?

A. It would be capable of producing a surplus of amperage—power does not enter into that.

Q. I understand.

A. You keep referring to power instead of amperage.

Q. It would be capable of producing a surplus of amperage? A. It would.

Q. There would be water power injected into that machine that would go to waste? A. It would not.

Q. It would not go to waste? A. No.

Q. What would become of that surplus amperage?

A. That surplus does not represent power because it is the wattless component of your circuit, in other words, it is that amperage which is wattless or powerless because it is an apparent condition and does not represent power.

Q. I know, but you don't mean to tell me, Mr. Wollenberg, that the change it would make in the use to [281—214] which you put this power that would affect the power factor, a change in the motor would in no wise affect the flow of water down hill at Sheep Creek, as it goes into the generator, would it?

A. Affect the flow of the water?

Q. Yes, the water would flow just the same?

A. Certainly.

Q. Then if the water was only sufficient—if the water was sufficient to create the amperage required

(Testimony of H. L. Wollenberg.)

at 70 per cent there would be a surplus of water would flow through the generator, if the amperage was increased to 80 or 90 per cent; is that not true?

A. That is not true.

Q. What would become of the other water—would it stay up the hill there?

A. No, the water would continue to run. A definite amount of water applied to the water-wheels will generate a definite amount of power, horse-power. Your efficiencies, etc., stay the same. Now, that power, that definite power that is generated by a definite amount of water flowing down a definite hill, can be converted into a current of unity power factor in which it takes a certain number of amperes and a certain voltage to reach this definite amount of power; or that power can be converted by that generator into another current on another circuit in which the power factor is less than unity.

Q. Well, Mr. Wollenberg—

A. Let me finish, please. In fact, the power factor [282—215] is nearly unity where a larger number of amperes at the same voltage are required for the same power.

Q. Well, I am assuming, Mr. Wollenberg, that there are no other lines upon this circuit except yours?

A. That assumption carries; I would not contradict that in any wise. You are considering variations of power factor on the same circuit?

Q. I am considering variations of power factor on the same circuit. A. So am I.

(Testimony of H. L. Wollenberg.)

Q. Now, what effect would these variations of power factor upon the same circuit have upon the flow of water as it flows down the hill at Sheep Creek?

A. Have absolutely no effect on the flow of the water as it flows down hill at Sheep Creek.

The COURT.—Well, let's not waste time on foolish questions like that.

Q. (By Mr. J. HELLENTHAL.) All right, your Honor. Now, Mr. Wollenberg, is it not true that 300 horse-power at 19 per cent power factor would require in total output in amperes that can be safely furnished from one of the generators at the Sheep Creek plant?

A. I could not answer that without calculating.

Q. How long would it take you to calculate?

A. A few minutes.

Q. All right, calculate it.

A. If you will tell me the characteristics of the generator. [283—216]

Q. Ask me what you want to know, you are familiar with that generator?

A. I want to know what you are talking about, same thing.

Q. Is it not a fact that 300 horse-power at 19 per cent power factor would require the total output in amperes that could be safely furnished from one of the generators at the Sheep Creek plant?

A. Well, now, what is the rating of the Sheep Creek generator?

Q. What is the rating?

(Testimony of H. L. Wollenberg.)

A. (By E. P. KENNEDY.) 1175 kilowatts at 100 per cent power factor.

A. (By WITNESS.) 19, did you say?

Q. Yes, sir?

The COURT.—Now, before we go ahead, let us see if you understand the question before we go any farther, so we won't have to do any unnecessary figuring. Suppose you state it as you understand the question.

A. Well, I understand the question is this: Would 300 horse-power at 19 per cent power factor require the entire amperage output of one of the Sheep Creek generators?

Q. (By Mr. J. HELLENTHAL.) That is right?

A. What is the amperage rating of the Sheep Creek generator?

Q. 294 amperes?

A. Is that consistent with 1175?

Q. 2,300 volts? A. That is correct.

Q. Correct. Is it not a fact, if you take 9.5 per cent [284—217] power factor would require the total output in amperage from both of the generators of the Sheep Creek plant?

A. That is correct.

Q. Is it not a fact, assuming the output at Nugget Creek to be approximately 1100 and the output of the steam plants at Treadwell to be 2000, that at 4.5 per cent power factor it would require the total combined generator capacity in amperes of the Sheep Creek, Nugget Creek and Treadwell steam plants combined?

(Testimony of H. L. Wollenberg.)

Q. Yes, sir, generating capacity?
ing capacity? A. Generating capacity?

A. You will read that question again, please?

Q. Assuming the capacity of the Nugget Creek plant to be 1100 and that the steam plant at Treadwell—combined steam plants to be 2000, would not the 300 horse-power at 4.5 per cent require the combined total output of the entire generating capacity in amperes of the Sheep Creek, Nugget Creek and Treadwell steam plants combined?

A. Well, I would have to make a calculation of that.

Q. Well, I don't care so much about that question. I will ask you this further question. It takes a little time to calculate. Is it not a fact, Mr. Wollenberg, that 300 horse-power at a one per cent power factor would require a generating capacity of 22,400 Kilowatts, or 19 such plants as are in use at Sheep Creek?

A. I would have to calculate that. You will have to repeat the conditions.

Q. Mr. Wollenberg, just before you answer the question as to the 19 generators—there are two generators at [285—218] Sheep Creek.

A. Well, do you ask me whether it would take the entire capacity of such plants there—did you ask me whether it would take the ampere capacity?

Q. Take the capacity of such a plant.

A. Well, that is an unanswerable question unless you can define the capacity in some way.

Q. What is capacity—ampere capacity, generat-

(Testimony of H. L. Wollenberg.)

A. You might as well ask the question so it can be answered. Now, you know that the generating capacity, if you mean power, is not the same thing as the ampere capacity. Now, tell me what you mean.

Q. I will read it right from this dope. Is it not a fact that 300 horse-power at one per cent power factor would require a generating capacity of 22,400 kilowatts or 19 such generators as are in use at the Sheep Creek plant?

A. If you use the word "generating capacity," I answer "No."

Q. You answer "No?" A. Yes.

Q. (By the COURT.) If used amperage you would answer "Yes?"

A. No, I would figure it and then answer it either "Yes" or "No," as my calculation shows. There is an enormous distinction between generator capacity and amperage capacity.

Q. (By Mr. J. HELLENTHAL.) The entire generating capacity in amperes, we will put that in. A. Yes, about 19.

Q. That is all right isn't it? [286—219]

A. Yes.

Q. Now, Mr. Wollenberg, in addition to adjusting your circuit-breaker so that it would not go out until 300 horse-power was drawn from the bus-bars as measured on a wattmeter which calculates and takes into consideration the power factor, you would instead of installing an instantaneous circuit-breaker, you would install a time relay circuit-

(Testimony of H. L. Wollenberg.)

breaker—is that it?

A. Well, you are asking me what I would do—what are the conditions?

Q. You told us this morning how we should regulate matters down at Sheep Creek?

A. I suggested a method.

Q. I am talking about your method?

A. Well, let me state what my method was. I suggested a method which in my opinion under the existing electric arrangements at Sheep Creek and on the lines of the defendant companies would satisfy as nearly as possible the conditions which the plaintiff company would enjoy if the contract were complied with and an uninterrupted current of 300 horse-power were delivered them. I simply offered an alternative arrangement which, under the existing conditions, might offer a practical way of fulfilling the spirit of the contract and the letter of the contract as regards the delivery of the 300 horse-power.

Q. According to your interpretation?

A. According to my interpretation.

Q. Now, I am asking you, according to your interpretation of the contract, for the same purposes that you have [287—220] mentioned, now in addition to establishing the wattmeter—

A. As the basis of measurement.

Q. —as the basis of measurement, and adjusting your circuit-breaker from time to time in such a manner that it would not go out until 300 horse-power were drawn as reported upon this wattmeter

(Testimony of H. L. Wollenberg.)

—now, wait until I get through my question—as reported upon this wattmeter, which takes into consideration the power factor, you would install, not an instantaneous circuit-breaker, but a time relay circuit-breaker; is that your method?

A. That is right.

Q. Now, the purpose of a time relay circuit-breaker is to enable the consumer for a short time, whichever time the time relay circuit-breaker is set, to draw a load in excess of the regular load; is that not true?

A. It enables him to draw an amperage in excess of the normal amperage, not necessarily a load.

Q. Well, amperage in excess?

A. That is a very strong distinction, and if you would stay with it we would not have so much trouble.

Q. Well, let us see about that distinction. When you draw an excess of amperage you decrease the amperage remaining for use by the Treadwell Company, do you not?

A. Not if that increased amperage is accompanied by a decreased power factor or a decrease in voltage.

Q. The voltage remaining the same?

A. Will then be a decreased power factor.

Q. How does the power factor enter into that matter? [288—221]

A. Because amperage at one power factor represents a different demand upon the generating capacity and upon the energy output of the genera-

(Testimony of H. L. Wollenberg.)

tor than it does at another power factor.

Q. Now, Mr. Wollenberg, you know, and know very well, that when you draw 80 amperes at 2,300 voltage you leave less available current for the use—for the defendant companies than you would when you draw 56 amperes at the same voltage, do you not? A. I know that is not so.

Q. That is not so? A. That is not so.

Q. The Treadwell Company can get the same power, the same working efficiency, when you draw 80 amperes at 2,300 voltage that they can when you draw 56; is that so?

A. You are assuming a constant source of prime motive power to the machine?

Q. I am assuming the motive power of the machine does not affect it at all?

A. I beg your pardon; the machine is producing with a given amount of water a given amount of power. Now, as we draw away from that amount of power up to a load of 300 the Treadwell Company are deprived of its use and if we were to exceed 300 and the generator is then making 500, as you say, and then we draw 300 horse-power there will be available for their use 200 horse-power.

Q. Now, then, we will say that the generator generates its full capacity, or is supposed to generate, when there is plenty of water, there is a certain amount [289—222] of electric current furnished you when you get 300 horse-power and then there is a certain amount that remains for use for the

(Testimony of H. L. Wollenberg.)

Treadwell Company; isn't that true, Mr. Wollenberg?

A. That is true.

Q. Now, when you change, your power factor does not affect the amount that remains for use by the Treadwell Company?

A. The amount of what?

Q. The amount of available power?

A. It would not affect the amount of available power.

Q. You could change your power factor to one per cent so that it requires the entire output in amperage of 19 machines and still draw upon the generating plant now existing at Sheep Creek and leave for the use of the Treadwell Company the same amount of power that they would normally have; is that true?

A. So far as the power is concerned—well, let me make one stipulation. You have introduced a condition of one per cent power factor which would probably involve changes in efficiency, and all sorts of things that we don't know at all, because it is such—it is not a case within reason. But if you will assume that the efficiency of your generators is only one per cent power factor—I don't know what a generator would produce with one per cent power factor—it is an unheard of thing—but assuming that is the case, and we are drawing on them for a current of one per cent power factor [290—223] drawing three hundred horse-power, this is what would happen, why, it would give the

(Testimony of H. L. Wollenberg.)

ampere capacity of this you mentioned—machines you mentioned, but the governors on these machines would shut down the water because these machines would not be receiving water enough, or the governors on these machines would turn the water off these machines and they would take a little bit of water, a very little bit of water necessary to furnish this 300 horse-power on these machines, but it would involve the capacity, the ampere capacity of those machines, but your governor on each one of those machines would turn the water or other prime motive source back, away from the motor, for although they are still generating 300 and each would demand a little bit of power to develop that 300. Do I make myself clear?

Q. You are not answering my question?

A. I am trying to.

Q. My question is, if the entire capacity of the Sheep Creek plant is drawn by you in amperage, is there any amperage or power left for the Treadwell people to use—yes or no?

A. If the entire generator—

Q. Generating capacity in amperage is taken by you—

A. —if the entire generator capacity in amperage is taken by us they would not use that—have no other power—could not use that—have no other power. Have to install more machines.

Q. Have to install more machines? [291—224]

But at the same time their prime motive source or

(Testimony of H. L. Wollenberg.)

power is then going to waste and not being used.

Q. I know, but I am talking about the machine they have there now?

Q. (By the COURT.) I would like to have this answered. Suppose the Treadwell Company kept right on using the power created; now, then, what is the condition as to the amperage with a one per cent horse-power?

A. If in addition to the load the Treadwell people would keep a load of 300 horse-power on with a one per cent power factor?

Q. Yes.

A. Yes, it would overheat the machines.

Q. That is the Treadwell machines?

A. The generating machines, whatever ones run the line.

Q. (By Mr. J. HELLENTHAL.) In other words, the generating machine couldn't furnish it, that is so?

A. No, couldn't furnish that amperage.

Q. Now, returning for just a moment to the time relay circuit-breaker. The object of the time relay circuit-breaker is to enable the consumer or whoever it is that draws from the bus-bars to momentarily draw a surge or starting current—what you call it surge—we call it starting current—an excess of current during the time for which the circuit-breaker is set; is that not right?

A. That is one of the purposes of a time relay circuit-breaker.

Q. That is one of the effects?

(Testimony of H. L. Wollenberg.)

A. That is one of the purposes, yes, one of the effects too. [292—225]

Q. What time would you set your circuit-breaker now if you were operating—a minute?

A. I would put an inverse time relay on there and set it at half a minute or a minute as conditions on the line needed, I would not—I would adapt that to the line, I am suggesting an arrangement to accomplish a certain purpose of delivering 300 horse-power, to deliver the equivalent of 300 horse-power, and it may be that from experiments as to the length of time the relays would be needed. I think a minute would satisfy it.

Q. All right. We are assuming now a minute would satisfy it and during that minute the customer or the plaintiff in this case would be able to draw that quantity in amperage and voltage that they likely desire? A. No.

Q. Would they not?

A. Not with the inverse time relay circuit-breaker that I suggested.

Q. Well, how much would that draw?

A. Well, you could control that.

Q. Suppose it is true your form K machine requires 600 additional horse-power to start—we will assume that to be the case—then you would draw for the minute of time that the machine was set an additional 600 horse-power, would you not?

A. No; no machine requires a surge such as that for the length of a minute. The peak of the surge is instantaneous and drops back.

(Testimony of H. L. Wollenberg.)

Q. How long would it require?

A. I don't know.

Q. For some space of time how much—length of a minute? [293—226]

A. Very much less than a minute, a surge of any magnitude.

Q. All right, we will say for ten seconds, half a minute, how will that go?

A. Are you talking about a peak surge or a surge of any magnitude for 300—

Q. And a peak surge?

A. Well, a peak surge only last momentarily.

Q. How long will you require that surge at all?

A. About 300?

Q. Yes?

A. Well, I wouldn't make a definite answer to that; I don't know.

Q. Probably a minute?

A. I am not sure, but much less than a minute.

Q. During that time you would require that, be it half a minute or ten seconds or a minute, it would be giving the excess of 300 horse-power, would it not?

A. It would under the existing conditions like where the voltage is artificially maintained constant, or nearly constant, probably it would.

Q. The only way in which you could draw an excess—we will say is the excess, is the additional three hundred horse-power—whatever it may be, might as well fix upon that as any, Mr. Wollenberg, for the purpose of getting it now—suppose you required an additional 300 horse-power during this

(Testimony of H. L. Wollenberg.)

short space of time you couldn't get that additional 300 horse-power unless it were there on the bus-bars for you to draw from, could you?

A. There isn't such a thing as putting it there on the bus-bars, Mr. Hellenthal; that is a condition that you [294—227] picture that does not exist.

Q. Well, you would have—the generating plant would have to be generating it then, put it that way?

A. In the case that these different power plants being connected in synchronism, these various plants of the defendant companies, if you get that excess power, why, naturally what you get it from you get from the generating plant.

Q. Yes?

A. But in the event of that Sheep Creek generator being disconnected or only having water enough to produce 300 horse-power the generator, would not have to produce 300 horse-power to start that motor.

Q. Your voltage would simply go down?

A. Your voltage would drop and your machine would perhaps lose a little in speed momentarily and accomplish a starting surge.

Q. If your power was large enough it would burn the generators on account of the sudden reduction in your voltage?

A. If your power was large enough to exceed the safe amperage of the corresponding capacity of the generator it would burn them.

Q. Now, we are not talking about that, Mr. Wollenberg. We are talking about the case as it exists over here. But you could draw the additional 300

(Testimony of H. L. Wollenberg.)

horse-power, it has got to come from some of these plants; some of these plants have got to generate it?

A. Every time that case exists, if you do draw 300, it has got to come from the plant [295—228]

Q. Now, if you install the time relay circuit-breaker such as you suggested and under the conditions of which you spoke, the additional surge or starting current can be drawn by the consumer at any time, can it not? A. Yes.

Q. It then becomes necessary for the power company furnishing the power to have its generator producing this additional 300 horse-power at all times; is that right—so as to have it there when it is demanded? A. Absolutely not.

Q. Where are you to get it from if you don't produce it, Mr. Wollenberg?

A. You will have the same condition that I spoke about a moment ago with reference to the individual plant operating there. If all the plants on the Treadwell circuit, on the entire synchronized circuit there were generating at a given capacity and that is not changed and the Treadwell Company itself is absorbing everything, the 300 horse-power of the available—

Q. Yes?

A. —of the available power and we started that motor, it will under those conditions—

Q. Yes?

A. —the surge of current which occurs on the start of your motor there acts as a pulsation on the line which is to the surge most impressed with it for the pulsation affects this drawing and simply means

(Testimony of H. L. Wollenberg.)

a surge of amperage to this point as a starting condition and an immediate restoration of normal conditions, and you don't have to have that extra [296—229] power in the circuit for the purpose of commencing—

Q. Provided you have sufficient power to furnish—

A. To furnish the 300.

Q. To furnish the 300? A. Yes.

Q. But the power is taken from the Treadwell Company's plant and as a result there is either a slacking down or shutting down of their plant, depending upon the size of the peak; is that not true?

A. Well, yes, the effect on the Treadwell system is dependent on the size of that peak.

Q. If the peak is small it will slow down the machine; if it is large enough it will shut down the machine; isn't that true?

Mr. SHACKLEFORD.—Just a moment, if the Court please. I would like to inquire of counsel if he is asking this question with reference to the conditions in this case, that is such a peak as would arise from starting the 300 horse-power?

Mr. J. HELLENTHAL.—Well, the question as to what this peak is, is a matter of testimony upon the witnesses don't agree.

Mr. SHACKLEFORD.—Well, they did the other night, approximately. I didn't know of any change.

Q. (Read by the REPORTER.) If the peak is small it will slow down the machine; if it is large

(Testimony of H. L. Wollenberg.)

enough it will shut down the machine; isn't that true?

A. In the case just stated, if large enough peak, it opens the circuit breaker—a peak of magnitude would open the circuit-breaker. [297—230]

Q. (By Mr. J. HELLENTHAL.) You would then put on an instantaneous circuit-breaker?

A. An inverse time relay circuit-breaker has the function of opening up immediately under a peak of predetermined magnitude.

Q. All right. Now, you were testifying a little while ago in answer to Mr. Shackelford's questions, that you commenced certain work—laid out certain work in connection with the operations of the plaintiff company and were dependent upon this 300 horse-power to furnish you with power; is that right?

A. I did not testify as to work that we laid out for this power, as I recollect it.

Q. Didn't you?

A. I don't recall so testifying. I will be glad to refresh my memory.

Q. Well, you have been connected with the plaintiff company for some time, Mr. Wollenberg?

A. Yes.

Q. A matter of a year or more? A. Yes.

Q. You knew all the time that this contract didn't furnish you starting peaks and didn't furnish you a horse-power or peak that you could utilize except with a snychronized motor for your purposes so you would get 300 horse-power?

A. You say I knew that?

(Testimony of H. L. Wollenberg.)

Q. Yes? A. No, I didn't know that.

Q. You know Mr. Kinzie?

A. Very well. [298—231]

Q. You remember meeting Mr. Kinzie in Mr. Shackleford's office? A. Very well.

Q. Some time about a year ago? A. Very well.

Q. You remember at that time you tried to negotiate with Mr. Kinzie to sell you these peaks?

A. No, I would be glad to relate what took place at that time.

Q. All right?

A. At that time I met Mr. Kinzie in Mr. Shackleford's office and told him of Mr. Thane's plans in the formation of these companies which would operate the property under discussion and also talked over regarding the and the Oxford-Treadwell 300 horse-power. I told him in effect of the consummation of those plans, that I expected to have a part in the designing and operation of the work to be done and was at that time considering what disposition we would make of the 300 horse-power if we received it and the plans consummated. I said to him at that time that I had read the contract and that it wasn't specific. It was a layman's contract—I am not attempting to repeat my exact words to you.

Q. Just in substance?

A. This is the substance of it. And I didn't see how in the deuce they could furnish us with an uninterrupted current of 3 horse-power and not allow us to take—

Q. (By Mr. SHACKLEFORD.) 300?

(Testimony of H. L. Wollenberg.)

A. Yes, 300. [299—232]

The COURT.—You said three.

A. (By the WITNESS.) I didn't see how they could furnish us with 300 horse-power and yet comply with the statement in the contract. It is to be uninterrupted except from natural physical causes beyond our control, because, I says, "I don't know of any electrical device will strain 300 horse-power off the line and not allow any more to pass." I says, "It looks to me a case of circuit-breaker"—that is exactly what I said to him—"a circuit-breaker set in there at 300 would interrupt the current every time we reached the height which we were to take, and," I said, "In practical operation it is very difficult to work up to 300 horse-power and not exceed it would have surges coming over the line or anything that will operate a circuit-breaker." I said to him, "It seems to me the equitable way to interpret this contract and operate under it is to put a curve-drawing wattmeter on there. We will then try to arrange our loads on this feeder in such a way that we will draw a maximum of 300 horse-power and when, in the event—in the summer-time you get more than you can use"—which I believe to be the case "and you are willing to sell us peaks, we can pay you for the excess." And that is the tenor of that part of the conversation I had with Mr. Kinzie.

Q. At that time Mr. Kinzie told you, Mr. Wollenberg, that he had no disposition to sell any power and if he did have such disposition you would have to consult with Mr. Bradley?

(Testimony of H. L. Wollenberg.)

A. He told me he thought that might be a nice way to [300—233] arrange it, but told me he wouldn't take any action and wouldn't discuss it, but he knew I was going to San Francisco and asked me to discuss it with Mr. Bradley.

Q. You went to San Francisco?

A. I went to San Francisco.

Q. And you talked this matter over with Mr. Bradley. What occurred between you and him?

A. Mr. Bradley first referred me to Mr. Kinzie and I informed him that I was—that I had seen Mr. Kinzie. Mr. Bradley next said, "I don't know who you are, any way. I don't know why you talk to me about this." I said, "Mr. Bradley, I have known you for a number of years and I thought if I came over here and told you I represented these people in this particular matter that would be sufficient." I said, "If you don't want to talk to me on that account I will produce credentials." He then passed that up. I said, "We are now preparing plans of the various companies and are about to purchase our electrical equipment." I said, "I would like to find out from you the manner in which you wish to make delivery of this contract and such other circumstances around it as you wish to suggest and prescribe, or, in other words, what your attitude is going to be, so far as consistent with our rights, so we can conform to it in the purchasing of the apparatus and designing of our system." I says, "I would like to discuss with you such features, whether you would object to our synchronizing with you, and what meas-

(Testimony of H. L. Wollenberg.)

ure you [301—234] intend to measure the current with—where you intend to allow us to attach our line.” Mr. Bradley says, “This is,” he says, “I am not an electrician; I don’t want to talk to you about it.” He says, “Besides, it is a question for lawyers.” He says, “It is a question for lawyers.” And then he said, “Anyway,” he said, “I don’t like you coming in here and trying to find out what we are going to do about the contract.” He said, “You have no business coming trying to find out what we are going to do; have no business trying to find us out.” I said, “I am not trying to find you out.” And I said, “I have come here in a spirit of fairness, previous to purchasing the machinery and designing the line to carry that power; I have come to you in a spirit of fairness to see what arrangements can make—to arrange the thing with you,” I said, “and to discuss the attitude of your company.” And the conference being at an end I left him.

Q. You didn’t tell Mr. Bradley at that time you would not be able to utilize or develop 300 horsepower except with a synchronized motor, but you could develop 300 horse-power with a synchronized motor?

A. I may have made the statement—no, I did not make that statement. The words I don’t remember; the exact statement I am not giving, but the substance. I may have said this—no, I didn’t make any such statement as that, Mr. Hellenthal.

Q. Didn’t you tell Mr. Bradley with a synchronized motor you could get out the entire 300 horsepower? [302—235]

(Testimony of H. L. Wollenberg.)

A. I may have said I could with a 300 horse-power synchronous motor, just in that way, but I never made the statement exclusively with a synchronous motor could use that 300 horse-power.

Q. You didn't state if you used an ordinary induction motor could not use 300 horse-power?

A. I made the statement, if used an ordinary induction, ordinary phase single motor equal to 300, that it would require a starting surge of amperage greater than that required during its normal running, and I asked Mr. Bradley what his disposition was regarding that—how he interpreted the contract, and he told me—

Q. What did he tell you?

A. He says, "The way that power is valued in the contract, he says, "is only valued at twenty-five thousand dollars in the contract," and he says, "power valued at so small a figure as that, that would mean that a surge would be allowed"; that was what he told me.

Q. Mr. Bradley told you that in San Francisco?

A. Mr. Bradley told me that in San Francisco.

Q. That is a year ago?

A. Approximately a year ago.

Q. Now, Mr. Wollenberg. you also know Mr. Kingsbury, at the power plant, do you not—the Treadwell power plant here?

A. Yes, I know him.

Q. Mr. Wollenberg, do you have any recollection why you were obliged to go to Treadwell to get the

(Testimony of H. L. Wollenberg.)

power back on when the circuit-breaker went out at Sheep Creek?

A. No, my recollection— [303—236]

Q. Yes.

A. —I know of no reason except, as previously stated, that Mr. Kennedy had suggested to me that it was a penalty that was—it was a penalty for our attempting to overdraw 300. He didn't use the word "penalty," but that was the substance.

Q. He didn't use that word?

A. No, not the word "penalty." I have been trying to recall the exact word he used. I think I said, "Mr. Kennedy, what the deuce they were doing, what the deuce they were figuring on to insist on an absurd and unreasonable condition like that." And he said, "Well, you fellows are trying to get more power than is coming to you," or words to that effect. He didn't use the word "penalty," but he implied it.

Q. Did you make a visit to Mr. Kingsbury at the Sheep Creek power plant about a month ago?

A. A visit of myself?

Q. Yes.

A. I have been there a number of times.

Q. You remember being there about a month ago, to the Sheep Creek plant, talking to Mr. Kingsbury, telling him—asking him to hold the circuit-breaker in so you could start or do whatever it was you wanted to do, that the people of Treadwell wouldn't know anything about it?

(Testimony of H. L. Wollenberg.)

A. No, I never asked him to hold the circuit-breaker.

Q. What did you ask him?

A. Did I ask him?

Q. In that connection?

A. Well, I don't know what you mean in that connection. [304—237] I have never asked him to hold the circuit-breaker in.

Q. What did you ask him to do in connection with the circuit-breaker—anything?

A. No, I never made a request on him to do anything in connection with that circuit-breaker.

Q. Ever make any request on him to do anything in the way of furnishing you a surge, as you call it?

A. I never have.

Q. Or had any talk with him about the matter at all?

A. I have had a considerable discussion with him upon the matters of the operation. I have called there a number of times and we had conversations regarding the setting of the circuit-breaker and his instructions regarding it and all the attending circumstances.

Q. Did you ever ask him to change the setting of the circuit-breaker? A. I never have.

Q. Did you ever ask him to do anything at all to the circuit-breaker? A. I never did.

Q. Never asked him at any time to give you anything you were not entitled to in such a way the Treadwell people wouldn't know anything about it?

A. I never did.

(Testimony of H. L. Wollenberg.)

Mr. HELLENTHAL.—That will be all. [305—238]

Redirect Examination.

Q. (By Mr. SHACKLEFORD.) Mr. Wollenberg, considering this starting surge and its effect on the Treadwell line, is it not true that the fly-wheel of the Treadwell plants would not carry their machine past any possible effect resulting from a starting surge of 300 horse-power?

A. It certainly would.

Mr. SHACKLEFORD.—Just read that question over again, Mr. Reporter, so the witness will understand it.

Q. (Read by the REPORTER.) Mr. Wollenberg, considering this starting surge and its effect on the Treadwell line, is it not true that the fly-wheel of the Treadwell plants would not carry their machines past any possible effect resulting from a starting surge of 300 horse-power?

A. It would; that is, assuming the normal load on our line.

Q. That is, the fly-wheel effect would protect them—protect them from shutting down or any trouble?

A. It would.

Q. Mr. Hellenthal has asked you to calculate the effect on their line with the power factor at 19 per cent and one per cent; state if this condition would ever exist under any ordinary working conditions such as our machines are rated at, etc.

A. I know of no conditions whatever whereby we would use 300 horse-power at a condition of power

(Testimony of H. L. Wollenberg.)

factor of my assuming those power factors.

Q. Do you know any condition whatever where the increased amount of amperage or momentary increase in amperage resulting from starting these machines would affect [306—239] the practical efficiency of the Treadwell operations?

A. I know of none.

Q. I want you to explain to the Court, Mr. Wollenberg, if the condition of unity power factor just being discussed here exists in this mining district at all.

A. Not at all, to my knowledge or belief.

Q. Is there any material difference between the operation of the machines of the plaintiff company and the operation of the machines of the defendant companies with reference to those drawing power from that plant? A. I know of no difference.

Q. If the power factor were figured out in both cases it would be below unity? A. It would.

Q. You say below unity and probably approximately—not the same, within the same—in the same rating something like the same rating?

A. Why, I think they are comparable; yes.

Q. Now, regarding the capacity of a generator's rating, what is the meaning of that? Explain the operation of that.

A. Well, the rating of a generator is controlled by the safe heating effects of the generator. Now, when a generator is rated for 1,000 kilowatts, it is a well-recognized fact that that generator will be called upon for surges of amperage in excess of the amperage corresponding to 1,000 kilowatts. For example,

(Testimony of H. L. Wollenberg.)

the information was given me here a few minutes ago that the amperage rating of the Sheep Creek generator is 294—that is correct, is it not—now, that does not mean that that machine will be dangerously overheated if called upon to produce more amperage than that for a [307—240] short period? As a matter of fact, it is now a standard practice, or nearly so, with the best manufacturers to rate a machine at a certain amperage, as this one is rated at 294, and then guarantee an overload capacity of 50 per cent for a certain period and of 25 per cent generally for a longer period. In other words, the manufacturer of a generator takes into account in his rating of that machine the fact that there are calls upon the machine for amperage in excess of its normal output and that provision is made for—that provision is made in every generator of reputable make. If I had the time I think I could find the rule in the American Society governing that subject. Is it desirable that I should look up this rule?

Mr. SHACKLEFORD.—Go ahead, Mr. Wollenberg; tell the Court about that.

The COURT.—Well, don't take up the time; do it some other time.

Q. (By Mr. SHACKLEFORD.) All right. Now, Mr. Wollenberg, we will assume that the defendants in this case are engaged not only in the delivery of power under contract to the plaintiff in this case but they are engaged in the sale of power from their circulatory system consisting of Sheep Creek, Nugget Creek and their turbine plant, which are to-

(Testimony of H. L. Wollenberg.)

gether, as I understand, to the Alaska-Juneau Gold Mining Company, a different and distinct corporation operating tunnels, for the purpose of driving tunnels near Juneau and in Snowslide Gulch. Assuming that its motors are not synchronous, would the power factor be involved in that delivery? [308—[241] A. Certainly would be.

Q. Assuming the power produced at Sheep Creek of a certain amount delivered to these various points where they have inductive motors, is there any way of equitably dividing that total power produced except upon the basis of the ratio?

A. The only equitable way of dividing that production is by wattmeter measurement upon the feeder of the various consumers concerned.

Q. And that measurement by wattmeter would involve the power factor of the various points of consumption? A. It certainly would.

Q. Lines of consumption. And if they delivered to themselves and the Alaska-Juneau power upon that basis and delivered power to us entirely upon the ammeter basis, who suffers thereby in the division of the total power produced?

A. We suffer, and they gain by whatever we suffer.

Q. Now, there is another question. In any conversation that you have had with Mr. Kinzie or Mr. Bradley have they ever offered to synchronize this current? A. Not in any conversation with me.

Q. Well, to place the machinery, synchronous machinery on the current? A. Never have.

Q. Have they ever requested you to do so?

(Testimony of H. L. Wollenberg.)

A. They never have.

Q. Assuming the setting of this circuit-breaker as it was originally set when they offered the power to you [309—242] after you had bought your machinery and installed it, would you have had any difficulty in proceeding during the winter if they had kept up the original power which was offered by that setting of the circuit-breaker?

A. We would have had none.

Q. Until after the fire or about the time of the fire in the Perseverance mine, there was offered to you a sufficient amperage according to the estimate to give you 80 amperes at least?

A. Sometimes as much as that; we had as much as that at that time.

Q. Which would be a correct amount under your power factor?

A. Be an amount equivalent to 300 horse-power at 72 per cent power factor, which is about what we have.

Q. Until the short winter season—the season of short water in Alaska here was any effort or information given upon their part requiring you to use a synchronized motor and reduce their current so it would be ample for you to use? A. None.

Q. What period of the year, with reference to the present time and the few months to ensue—what period of the year is the low water period at Sheep Creek?

A. Well, it is the ensuing two or three months during the normal year.

(Testimony of H. L. Wollenberg.)

Q. Now, Mr. Hellenthal has asked you a number of questions with reference to the change in power factor commencing at Sheep Creek where you delivered power right at the plant and carrying it on up to the Perseverance and then [310—243] up to Skagway. I don't know whether he drew the 300 horse-power out as far as Dawson or not, but I don't think he did. But I want to ask you this question: Has the power factor—the change in the power factor anything to do with your line loss, which is chargeable as against you, and your transformer loss—actual loss of power?

A. Yes, the power factor in a system increases the line loss; but in this particular case the whole question and all the series of questions that Mr. Hellenthal asked me were based upon the delivery of 300 horse-power at the panel at Sheep Creek. Now, the line losses between here and Skagway, or wherever you choose to take that current, are suffered by the plaintiff company, and were the current actually taken to Skagway the amount available there to the plaintiff company for useful work, if they were getting 300 down here, would be a very trivial amount, even if they wanted to have high voltages and very heavy lines in order to transmit a small amount that ridiculous distance.

Q. The meter when placed on a switch-board at the Treadwell plant measures the power actually passing over the line at that point?

A. That measures the line losses—the entire consumers' power from that point out to wherever the

(Testimony of H. L. Wollenberg.)

furthermost load is. That wattmeter down at the Sheep Creek panel sums up all the losses, whether they have line losses, efficiency losses, in the motors, losses in the transformers or any other losses, it sums them [311—244] up and that is the entire amount of power delivered at that point.

Q. Would that wattmeter correspond with a meter at a distance? A. No.

Q. Where you actually use the power?

A. No, it would not. If you had one meter down at the Sheep Creek panel reading 300 horse-power and another up in the Perseverance mine that one up there would read less by some—I won't attempt to state the amount—but whatever amount of the current is consumed in heat on the lines and transformer losses and the further we take the power it will increase our losses tremendously, and so the less we have for useful effect; but that does not have any bearing on the particular case before us, and whether we use it up in line losses or in the motors or running lights or whatever we like doesn't affect the current furnished nor does the power factor in our system affect the amount of actual prime motive power used to give your 300 horse-power. The distinction must be made clear between efficiency and power factor. Efficiency is an actual loss of power due to a combination of electrical energy and the heating or any other loss, and a motor consumes power by mechanical transportation since electrical—mechanical energy, the power factor accompanies a condition in the circuit in which the voltage and

(Testimony of H. L. Wollenberg.)

amperage are not in phase with each other and it is entirely a condition of the circuit, [312—245] does not represent a loss of power, and should in no way be confused with efficiency.

Q. Well, Mr. Wollenberg, just one other question I will ask you. It is certain that with a given amount of water productive of 300 horse-power that the beneficial use of a current of 300 horse-power can be procured by separate generators?

A. It is certain.

Q. That is the only way that you know of without an equitable adjustment of securing an uninterrupted current from the defendants' plant?

A. That is the only way I know of.

Recross-examination.

Q. (By Mr. J. HELLENTHAL.) Just one question, Judge. Mr. Wollenberg, the lighting plants in this country will develop power at unity power factor, do they not—that is practically unity power?

A. Develop it at that?

Q. That is the lighting plants all take power at unity power factor?

A. Not lighting plants—lights themselves.

Q. The lights themselves?

A. But the distributing system for the lights has a power factor which affects the current.

Q. But you told Mr. Shackelford a moment ago, in answer to the question—I think you overlooked the lighting plant—

A. No, he asked me, as I remember it, whether I knew of a [313—246] power circuit having unity

(Testimony of H. L. Wollenberg.)

power factor—is that the question you referred to?

Q. Yes. A. Well, I referred to it.

Q. Don't you know the lighting circuits have unity power factor?

A. No, they have nearly unity power factor.

Q. That is what is usually regarded as power factor—usually regarded as unity power factor?

A. No, it depends if you have a light put in a place where you don't transfer the circuit and your lights lead from your generator, that light will but then you would have practically a unity power factor, but if you have a lighting company in a big city with a large transformer they don't have a unity power factor.

Q. The big cities in Alaska are rather scarce?

A. Well, this town is big enough for the distributing system to have a considerable power factor.

Q. Well, now, Mr. Shackelford also asked you whether any other form of motors were in use in Alaska except the inductive motors similar to the ones you use. Did you ever see a form K motor or compressor in your life except where you have it up to the Perseverance? A. Yes.

Q. Where?

A. I myself installed one in a mine near Eureka, California.

Q. Near Eureka, California? A. Yes, sir.

Q. Any others?

A. I don't recall—I can't name any other place where I know they are. [314—247]

Q. The only power plant in Alaska that generates

(Testimony of H. L. Wollenberg.)

power for use in connection with mines are the Sheep Creek and Nuggett Creek plants of the defendant companies? A. In Alaska?

Q. Yes.

A. I would not pretend to say, Mr. Hellenthal.

Q. Do you know of any other?

A. I believe the Ketchikan Power Company furnishes some, though don't know that; I am not certain.

Q. There is a small power plant at Ketchikan for lighting purposes and probably furnishes some power?

A. I am not sure. I have no personal knowledge.

Q. You have no personal knowledge of the Ketchikan plant furnishing power for motors?

A. No, I have no personal knowledge.

Q. The only motors used in Alaska are motors in use by the defendant companies and yourselves?

A. The only motors in use in Alaska?

Q. Yes, the only power motors? A. Why, no.

Q. Where are the others?

A. I remember seeing some at the ice plant down at Ketchikan and I have no doubt that the—why I have heard of several installations of—of electrical installations in Alaska, I don't know as I could place them.

Q. Did you see them? A. No, no.

Q. You don't know what kind of motors they are?

A. No. [315—248]

Q. May be synchronous motors or may be induction motors? A. Yes.

(Testimony of H. L. Wollenberg.)

Q. Mr. Wollenberg, with reference to your qualifications as an engineer, I don't want to go into it very far. What school did you attend?

A. The University of California.

Q. When did you graduate? A. 1908.

Q. 1908. And what kind of a course did you take?

A. Took a course in mining engineer, and included with it a large number of courses in the department of civil engineering and electrical engineering.

Q. You didn't take a complete course in electrical engineering?

A. I didn't graduate as an electrical engineer.

Q. Your experience as an electrical engineer is confined to what you have had here since you graduated; is that not true?

A. Why, since I graduated—well, let it be understood in the beginning that I do not claim special and exclusive experience as an electrical engineer.

Q. You don't claim to be an electrical engineer?

A. An exclusive electrical engineer. I regard myself as a mining engineer and as such have performed many of the functions of electrical engineer.

Q. Your experience as electrical engineer is confined to the installing of the gas plant here and to the work done at Salmon Creek? A. No.

Q. What other work have you done?

A. I was engineer in charge of the Tahl Mining Company at Smoxville, Eureka County, California.
[316—249]

Q. That is where you installed that form K motor?

A. No, that is not, that is another place.

(Testimony of H. L. Wollenberg.)

Q. How long were you there?

A. I was there about eight months, I think.

Q. What kind of a concern is that?

A. O, it is a gravel-mining concern.

Q. How large a plant have they got?

A. Why, they installed a plant for—let's see; I guess there were about six hundred horse-power motors in the plant.

Q. When was that? A. When was that?

Q. Yes. A. It was in 1910.

Q. 1910. What other experience have you had?

A. Well, I was—I was part owner in a lease of a mine near Eureka, a small place, and personally installed and operated motors at that plant.

Q. How large were the motors?

A. The biggest motor there was 25 horse-power, a small plant.

Q. What other experience have you had?

A. While an assistant at the North Star mine in Nevada County, California, I was a mechanical draftsman and designer and various other functions there, and while not having the entire responsibility of it—I was assistant in that instance—I worked upon the design and installation of a large number of motor-driven units including a new cyanide plant, new motors in the mill and various things.

Q. How long were you there, Mr. Wollenberg?
[317—250]

A. I was there four months.

Q. Four months. What other experience have you had? A. In electricity?

(Testimony of H. L. Wollenberg.)

Q. Yes.

A. Those are the chief. Those are my chief experiences in electrical machinery exclusive of the experience with this company.

Q. And that includes the installing of the gas plant here and developing the Salmon Creek plant, as it is called?

A. Yes, the designing and installing.

Q. A recording wattmeter, Mr. Wollenberg, would record the surge as you call it, or as I say starting current, on the dial, would it not?

A. What sort of a meter are you speaking of?

Q. A curve reading meter.

A. You mean a curve drawing meter?

Q. A curve drawing meter. It would show a peak, would it not?

A. It would within the limits of the mechanism show the continuation and the entire output of the feeder.

Q. It would show the peak at the time *the time* the peak went in, would it not? A. It would.

United States
Circuit Court of Appeals

For the Ninth Circuit.

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(IN THREE VOLUMES)

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Appellants,

vs.

ALASKA GASTINEAU MINING COMPANY, a Corporation,

Appellee.

VOLUME II.
(Pages 353 to 800, Inclusive.)

Upon Appeal from the United States District Court for the District of Alaska, Division No. 1.

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(Testimony of H. L. Wollenberg.)

Re-redirect Examination.

Q. (By Mr. SHACKLEFORD.) You say you are from the University of California? A. Yes.

Q. Does the community boast of any other mechanical geniuses from there—are there any other graduates here in this [318—251] room?

A. I think so.

Q. All right; we will find them.

A. I see a few of them here.

Q. (By the COURT.) Mr. Wollenberg, if I understood you correctly, you said that the line loss and transformer losses would influence the power factor at the Perseverance?

A. No, I didn't mean to state that if I did. What I meant to say, and I will restate it, a transmission line of itself introduces a power factor into the circuit. Therefore, the length of that transmission line will influence the power factor because the longer it is the more it influences the power factor, but the line loss upon that line is another thing entirely apart from the power factor.

Q. Let me put it in another way. Do I understand you to say in figuring your power factor at the Perseverance, two of the elements to be considered would be the length of line between Sheep Creek and the Perseverance and the transformers?

A. Two things influence the power factor.

Q. Well, did you figure that in arriving at the power factor of it?

A. The total power factor of the system?

Q. At the Perseverance mine?

(Testimony of H. L. Wollenberg.)

A. Yes, I did consider the question of the power factor of the motors, of the transformers, and of the line, but it is a thing apart from the losses of the power in those lines, the losses of power in those lines are questions of efficiency. If you put big lines in and keep up the high voltage you have very small line losses. [319—252]

Q. But I don't want to line losses at all; I want to get at the power factor.

A. Well, a line loss is a thing apart from the power factor entirely.

Q. Therefore, don't consider it; just tell me, if you can, how much of an element the line and transformers are in considering the power factor of the plant at the Perseverance.

A. Well, they are a very small element, if the transformers are fully loaded, because if the transformers are fully loaded their power factor is very high and that wouldn't have very much effect, and the line is also short; it has a very small effect, so, under ordinary conditions, the chief factor in determining power factor is the motor and not the distributing system, although that may be important.

(Whereupon court took a recess for a few minutes.)

(And thereupon court again convened, and all parties being present as heretofore, further proceedings were had as follows:)

Mr. SHACKLEFORD.—If the Court please, I wish to offer the testimony of Mr. Zakahu, taken at the temporary hearing in this case—that is, I have

(Testimony of D. W. Proebstil.)

no further witnesses at this time. It may be—

Mr. J. HELLENTHAL.—I object to the testimony offered because Mr. Zakahu is here and should be called.

Mr. SHACKLEFORD.—Very well, I will bring him in then some day. [320—253]

[Testimony of D. W. Proebstil, for Defendants.]

D. W. PROEBSTIL, being called and duly sworn, testified on behalf of the defendant, as follows:

Direct Examination.

Q. (By Mr. J. HELLENTHAL.) State your full name. A. D. W. Proebstil.

Q. Where do you live, Mr. Proebstil?

A. Treadwell.

Q. What is your occupation and business?

A. Electrical engineer, in charge of the electrical work of the Treadwell Mining Co.

Q. When you speak of the Treadwell Mining Co., do you mean the allied corporations known as the Treadwell Co., that is, the three companies?

A. I do.

Q. And including also the Alaska-Juneau Co.?

A. Yes, sir.

Q. How long have you been employed as such engineer in charge of those works?

A. Since December 1, 1912; a little over one month.

Q. You have stated that your occupation or profession is that of an electrical engineer? A. I have.

(Testimony of D. W. Proebstil.)

Q. How long have you been an electrical engineer, Mr. Proebstil?

A. Dating from my graduation from college, been seven years and a half.

Q. What college did you graduate from?

A. From the Oregon Agricultural College, took a course in electrical engineering.

Q. Took a regular course of electrical engineering?
[321—254]

A. A special course in electrical engineering; yes, sir.

Q. What experience have you had since the time of your graduation, Mr. Proebstil, as an electrical engineer?

A. Immediately following that time I entered the General Electrical Co. at Schenectady, New York, as a testman, taking their course in the testing department for a period of nearly two years.

Q. You spent two years for the General Electric?

A. At Schenectady, New York, in their testing department.

Q. You took a course there? A. I did.

Q. That is a complete course?

A. A complete course in their testing department.

Q. Then what did you do?

A. Following that I took a position as installation engineer for the Portland Storage Light & Power Co., Portland, Oregon, in which capacity I served for two years and a half.

Q. Then what did you do?

A. Following that I took a Civil Service examina-

(Testimony of D. W. Proebstil.)

tion in the Government and went to the Philippine Islands in the engineering department in the fortification works at the mouth of Manila Bay, and spent two years and a half there in complete charge of all the electrical work at the four fortifications.

Q. For two years and a half you were in complete charge of the electrical works at four fortifications in the Philippine Islands? A. Yes, sir.

Q. Then what did you do?

A. I came back and was sent by the General Electric Co. into [322—255] Alaska to install the electrical apparatus of the Nugget Creek plant for the Alaska Treadwell Co.

Q. And from that time on you have been connected to now with the Treadwell Co.? A. I have.

Q. After the Nugget Creek plant was installed you were placed in charge of the entire electrical apparatus of the three companies? A. I was.

Q. And you are now serving in that capacity?

A. Yes, sir.

Q. Are you familiar with the defendant companies' plant at Sheep Creek? A. I am.

Q. How long have you been familiar with that plant, Mr. Proebstil?

A. The first time I visited that plant, I believe, was on October 27, 1912. I was there about half an hour. The second time I was there, I think, was about December 4th.

Q. That is after you had taken charge?

A. After I had taken charge; yes, sir.

Q. Are you familiar with the apparatus used

(Testimony of D. W. Proebstil.)

there—the circuit-breaker and other materials?

A. Yes, sir.

Q. The meter that is there installed? A. I am.

Q. Are you familiar with the various forms of motors in use, first, induction motors such as form K, M, and P, and synchronous motors—the various motors that are in use, are you familiar with them?

A. I am familiar with practically all types of motors that [323—256] are in practical use.

Q. You know what—how electricity is used in connection with lighting purposes, Mr. Proebstil?

A. I do.

Q. Familiar with that branch of it. Now, Mr. Proebstil, what is the generating capacity of the Sheep Creek plant?

A. Our generating capacity based at 100 per cent power factor is 2,350 kilowatts.

Q. How much horse-power?

A. That is in the neighborhood of 3,000 horse-power approximately.

Q. Now, first, before—wait a minute—what is meant when you speak of generating capacity and the power factor of a generating plant?

A. Kindly ask that question again.

Q. What is meant when you speak of power factor as used in connection with a generating plant? When you say a generating plant has a certain power factor, what is meant by that statement?

A. Well, the power factor of a generating plant is the power factor that exists normally upon the bus-bars of that plant and represents the ratio of the

(Testimony of D. W. Proebstil.)

actual power delivered to that bus and the apparent power delivered to that bus—the ratio in watts.

Q. What is the power factor at the Sheep Creek plant?

A. It varies. Sometimes it is as high as 95 per cent, at other times it is lower. Possibly runs down to 70 per cent, depending upon the conditions existing at our steam plant at Treadwell and our hydraulic electrical, [324—257] the plant at Nugget Creek. It is very possible to operate that plant at 100 per cent power factor.

Q. Now, does that power factor in any way affect the power factor that may exist upon any of the branch lines?

A. Decidedly not. The other conditions being true, it is the power factor of the outgoing lines that determines the and determines the power factor of the bus at the stations.

Q. You are familiar with the line of the plaintiff company, that is, that conducts the power from the Sheep Creek plant to the Perseverance?

A. Only in a general way.

Q. Yes, in a general way. You know what the power factor is that exists on that line?

A. I do not; neither do they.

Q. Now, what is meant by power factor?

A. A power factor is a numerical factor 1 or less which is used in multiplying the product of volts and amperes gives the actual power; in other words, it is the ratio existing between the actual power consumed

(Testimony of D. W. Proebstil.)

in a circuit and the apparent power consumed in a circuit.

Q. By apparent power you mean available power?

A. No; I mean the power that was apparent from the taking of two elements, one the volts according to the load, and the other the current in the load or of the load rather.

Q. And by the power produced you mean the power that is actually created?

A. Actually created in the circuit.

Q. In the circuit by the use of the motor?

A. Not necessarily a motor. Whatever is used.

Q. Whatever is used? [325—258] A. Yes.

Q. Now, is there any power factor inherent in your apparatus at Sheep Creek between your bus-bars and the point where you deliver the power to the Perseverance Company? A. No, there is not.

Q. No power factor whatsoever?

A. Because that part of the apparatus is non-inductive.

Q. Non-inductive. If there is a power factor on the line, the Perseverance line, the plaintiff company's line, where does that power factor exist, in what apparatus?

A. It exists in the line and is a resultant from the combined inductive effect of the transmission line, transformers and devices using the power, such as the motors.

Q. Upon what does the power factor of the Perseverance line depend?

A. It depends on, first, the type of machines draw-

(Testimony of D. W. Proebstil.)

ing power from that circuit. It depends upon the inductive effect of their transmission line which varies indirectly with the length, which varies as the distance—the interaxial distance of your wires on the course—while that is the distance between wires, it depends on the conditions of transposition of the wire, for instance, and on the size, whether coppered, and depends on the amount of current drawn from or in the line. There are a great many things that determine the power factor. Other things being equal, for instance, a current of 50 amperes over the line would develop a certain power factor, and a current of 100 amperes would change the power factor; in other words, the resultant inductive effect of the line varies with the current drawn over that line.

Q. How is the power factor affected by the use of different [326—259] machines? Do different machines have a different power factor?

A. Decidedly.

Q. What is the difference in your power factor usually between form K motors and of form M or P motors, for instance, which has the greater power factor?

A. Well, other conditions being equal with respect to the design of the machine and load, there should be no difference in power factor.

Q. Should be no difference?

A. No, not in these types of motors. The only difference in those types of motors is the method of starting. After once started and operating under normal conditions their power factors are identical.

(Testimony of D. W. Proebstil.)

Q. Now, are there in use, in actual use, in connection with electrical operations an almost infinite number of types of motors, are there not, Mr. Proebstil?

A. Well, there are a great many types, yes, sir.

Q. A great many types and the various types vary in the power factor? A. Yes, sir.

Q. The power factor, is that also affected by the manner of installation and the manner of operation and things of that kind?

A. The manner of installation has a great deal to do with the resultant power factor of the service.

Q. How much to do?

A. In the manner in which the service is designed or the circuit is designed.

Q. Does the power factor—is the power factor of the same [327—260] machine in operation always constant, or does it vary?

A. It varies with the varying load conditions.

Q. The power factor at one instant, then, on the same machine varies, that is where the machine is in actual use, varies, as I understand it, with the power factor at another instant on another machine?

A. It does.

Q. Where the power is used for lighting purposes, what is the normal power factor?

A. If proper line construction had been taken care of, the power factor is extremely high, may be—well, I should say 99 per cent.

Q. Practically unity?

A. Very nearly unity; yes, sir. That is on an exclusive lighting circuit.

(Testimony of D. W. Proebstil.)

Q. In the case of synchronous motor?

A. The power factor may be varied by conditions governable at the machine by excitation of what is known as the covering field, or the field element of the machine. The power factor may be varied and may be brought to unity.

Q. May be brought to unity?

A. Yes, sir, but no higher.

Q. You don't agree with Mr. Wallenburg that it may be brought higher than unity?

A. No such thing as having a power factor beyond unity. You can bring it up to unity and if it goes beyond that you get a leading power factor, which gives you the same result as a lagging power factor. We have two distinct kinds of power factor; one called a leading power factor and the other a lagging power factor. [328—261]

Q. What is the difference?

A. A leading power factor is the power factor arising from having a current lead the electro motive force by a certain prime element. The lagging power factor is a power factor caused by having the current lagging behind the electro motive force by a certain time element.

Q. Is there any manner, Mr. Proebstil, in which you at the power plant at Sheep Creek could either control or affect the power factor in the Perseverance mine? A. Absolutely none.

Q. The dial—

A. Beyond our control absolutely. We simply—

Q. As to what they would—

(Testimony of D. W. Proebstil.)

A. On their line we can put a certain voltage impressed to that voltage impressed, that causes the current flow, and whether or not that current is in phase with the electro motive force in phase depends on conditions over which we have no control.

Q. Entirely within the control of the plaintiff company? A. It is.

Q. Now, explain to the Court the methods employed by you in delivering to the plaintiff company an uninterrupted current not to exceed 300 horsepower.

A. A current not to exceed 300 horse-power?

Q. I wish to call to your attention, Mr. Proebstil, in other words, the language of the contract that the Court is now considering. The language of the contract in that connection is as follows: "Shall elect to take a current of not to exceed 300 electric horse-power which shall be taken from and at the generating plant to be installed," [329—262] and so forth. What does that mean, Mr. Proebstil? What does that mean? A. It means—

Mr. SHACKLEFORD.—Wait just a minute. I want to make my objection. We object to this as incompetent, immaterial and irrelevant.

The COURT.—Objection sustained. I wish the witness might answer; that would save my doing so.

Mr. HELLENTHAL.—Well, your Honor, this is a matter of expert testimony what these technical terms mean.

The COURT.—He can explain the terms, but not explain the contract.

(Testimony of D. W. Proebstil.)

Q. (By Mr. J. HELLENTHAL.) What does those terms mean?

Mr. SHACKLEFORD.—We object to the question asked him to interpret the phrase. If any particular word there we have no objection.

Q. (By Mr. J. HELLENTHAL.) What is the meaning of the term “current not to exceed 300 horse-power.”

Mr. SHACKLEFORD.—Same objection.

Mr. J. HELLENTHAL.—If the Court knows, might as well stop the case right here.

(Argument by counsel.)

The COURT.— * * * Now, if this witness is acquainted with contracts where such expressions are used, he is qualified as a witness. If he isn't then have to go back to the terms.

Q. (By Mr. J. HELLENTHAL.) Do you know what the meaning of those terms are as used in an electrical contract? A. I do.

Q. Are you acquainted with electrical contracts in which [330—263] terms in relation to power are used? A. I am.

Q. Now, answer the question: What is the meaning as used in electrical contracts of the term “current not to exceed 300 horse-power”?

Mr. SHACKLEFORD.—Just a minute. I will ask permission to examine the witness on his *voir dire*.

Mr. J. HELLENTHAL.—All right.

Q. (By Mr. SHACKLEFORD.) Mr. Proebstil, you are going to be asked concerning a certain phrase

(Testimony of D. W. Proebstil.)

which has been called to your attention. Where have you seen a phrase of the same character?

A. I didn't say that I had seen—

Q. And construction?

A. I didn't say that I had seen a phrase of the same character. I say I am familiar with contracts, that is, I have seen contracts in which power is called for, or words to that effect.

Q. Now, in your construction that you would be willing to place before this Court on that meaning comes from a technical use of the word?

A. Distinctly.

Q. And would be derived by you from authorities on that subject, wouldn't it? A. And experience.

Q. Well, in this particular instance is your claim to experience based on your knowledge of certain authorities upon the subject? A. Yes.

Q. Or upon experience, which?

A. Both. [331—264]

Q. Well, now, I will ask you where you have run across this phrase in experience?

A. What phrase?

Q. The phrase which Mr. Hellenthal is asking you to construe?

A. A current of 300 electric horse-power?

Q. Yes. "A current not to exceed 300 horse-power," I think that is the words he used.

A. Well, might not be that particular phrase, but might have been "a current not to exceed 500 horse-power," other conditions being equal.

Q. I will put the question so far as the current at

(Testimony of D. W. Proebstil.)

any amount, where have you run across that expression?

A. Almost every day in my experience, practically speaking.

Q. Well, let's have a few instances so to see whether you are qualified.

Q. (By the COURT.) Talking about contracts now.

A. Well, I am not. He asked me in regard to technical information.

Q. You are asked in regard to contracts in practical experience.

A. So far as that is concerned I have never drawn up any contracts myself.

Q. (By Mr. SHACKLEFORD.) Well, has it been your function to construe contracts carrying a phrase of that sort?

A. No, it has not. My work as an engineer has been along technical lines.

Q. Now, outside of that you claim an expertness with reference to the matter or things that you have gotten out of books. Now, what authority have you consulted to get a definition of the words whereby you undertake to speak [332—265] as an expert upon that subject?

A. Perhaps that couldn't be referred to any one authority covering the entire phrase; no.

Q. Well, what several authorities have you consulted?

A. Oh, I have studied a great many authorities on electrical engineering.

(Testimony of D. W. Proebstil.)

Q. All right, every word of that. The thing I want to get at is what authorities you expect to show or particular authorities you have studied?

The COURT.—I don't think any use of going any farther. The witness is not qualified with reference to contracts of this sort. Now, you can go back to the meaning.

Mr. J. HELLENTHAL.—Take an exception.

The COURT.—Exception allowed.

Q. (By Mr. J. HELLENTHAL.) What is meant by the term "current of electricity"?

A. Current of electricity?

Q. Yes.

A. A certain flow of electricity in the conductor.

Q. Anything to do with horse-power?

A. It has.

Q. What has it to do with horse-power?

Mr. SHACKLEFORD.—You are asking him about a particular word?

Mr. J. HELLENTHAL.—Asking him about the meaning of the words "current of electricity."

The COURT.—As applied to horse-power.

Mr. J. HELLENTHAL.—As applied to horse-power—now, asking the witness to explain what is meant by that word current? [333—266]

A. (By the WITNESS.) A current is one of the factors of power.

Mr. SHACKLEFORD.—Make the same objection. I don't think the witness is qualified.

The COURT.—Objection overruled. Proceed.

Q. (By Mr. J. HELLENTHAL.) What is meant

(Testimony of D. W. Proebstil.)

by the word "current"? Explain it so the Court can understand it.

A. A current is a flow of electricity and is measured in units. It is one of the factors of electrical power, the other factors being voltage—power is the product of current times voltage—a current of one ampere impresses an electro motive force—a watt is a unit of power—one watt flowing for a period of one second is equivalent to so many foot pounds of work, numerically is .7375—746 of these watts is equivalent to one horse-power, that is the connecting link between the electrical unit of power and the mechanical unit of power is the watt, and it is an equivalent in foot pounds per second is .7375.

Q. That is to say, 746 watts are the equivalent of one horse-power, an electric horse-power?

A. Yes, sir.

Q. Now, how is your circuit-breaker at Sheep Creek set?

A. The circuit-breaker at Sheep Creek is set so it will open if the current exceeds 56 amperes.

Q. At what voltage?

A. At any voltage. The voltage is constant. On the bus, however, is 2,300 volts.

Q. Now, what power is that the equivalent of, what horse-power, the electric horse-power, 56 amperes at a voltage impressed of 2,300 on the bus? [334—267]

A. That is equivalent to 300 horse-power at their apparatus on the bus which is non-inductive, comprises, or, we may say, comes from the circuit-breaker to the bus-bars and returns from the bus-bars to the

(Testimony of D. W. Proebstil.)

outside of the building.

Q. Now, explain to the Court just how you arrive at that current.

A. How I arrive at that current?

Q. By what method you are using if you arrive at the fact that 56 amperes, that 56 amperes at a constant voltage of 2,300 is the equivalent of 300 horsepower?

A. If you will multiply 300 by 746, which is the number of watts in a horse-power, if you will divide that number of watts by 2,300 volts, and again divide that product by the square root of three, which is the phrase factor existing in all three phases, you will arrive at an answer of 56 which represents the current per phase, that is, in a non-inductive effect.

Q. Is there any other method of determining the horse-power determined at that point?

A. At that point there is absolutely no other method, because, as I said before, the inherent power factor of that particular piece of apparatus is unity.

Q. You say there is no particular—there is no inherent inductive effect on that piece of apparatus?

A. There is none.

Q. Now, how is your circuit-breaker set—at 56 or a little above?

A. It has never gone out exactly at 56; it has always exceeded 56 by a very slight amount—between 56 and 60.

Q. Does the circuit-breaker when so set permit an uninterrupted electrical current not to exceed 300 horse-power? [335—268] A. It will.

(Testimony of D. W. Proebstil.)

Q. Is there anything in connection with your apparatus at Sheep Creek that will interrupt the flow of current not to exceed 300 horse-power?

A. There is nothing.

Q. Have you any means or apparatus or any device there that interferes with the drawing of a current not to exceed 300 horse-power by the plaintiff company at that point? A. I have not.

Q. Or anything to interrupt the continued flow of such a current? A. I have not.

Q. Now, Mr. Proebstil, I think you have already testified that the—what effect does the power factor inherent in your own apparatus at Treadwell have on the power factor at Sheep Creek leading to the—

A. Has absolutely no effect whatever.

Q. Any possible way in which it could have any effect?

A. Absolutely no way in which it could affect their lines. I want to make it plain that the power factor at a generating station depends and is determined by the power factor of the circuits leading from that station, and not the power factors of the circuits leading from the station affected by the power factor of the station.

Q. The power factor existing in the Perseverance or in the plaintiff's machinery, line or machinery, depends on what solely the—what is the sole thing upon which it depends?

A. Depends entirely upon the inductive effects of their circuit.

Q. Of their own circuits? [336—269]

(Testimony of D. W. Proebstil.)

A. Of their own circuits and their own apparatus which they have seen fit to install.

Q. And is in no wise affected by any of your apparatus? A. By nowise.

Q. Now, what is the character of the circuit breakers you have?

A. It is an instantaneous circuit breaker.

Q. By an instantaneous—

A. That is the one on their feeder.

Q. On their feeder?

A. An instantaneous circuit breaker.

Q. Have you any other sort of circuit breaker in use? A. We have.

Q. What is that?

A. It is a time-limited relay.

Q. In connection with what is the time-limited relay used?

A. It is used only on main lines, transmission lines connecting one station with another.

Q. How many time-limited relay circuits have you in use in connection with all of your plants?

A. We have three in use and one other that is not in use. We have four in the entire installation of 5,000 kilowatt capacity.

Q. Where are the three used?

A. We have one at Sheep Creek; another at Nugget Creek; another in use at Treadwell; and another not in use at Treadwell.

Q. Those in use at Sheep Creek and Treadwell are in use on what character of line?

(Testimony of D. W. Proebstil.)

A. On the main transmission line only. [337—270]

Q. What is the purpose and object of the time relay circuit-breaker?

A. The object and purpose of a time relay circuit-breaker is to allow the small feeder lines, sort of sub-stations, in case of trouble to open first due to their instantaneous relays and the main transmission lines still stay in commission or in service; in other words, the time-limited relay holds the action of the increasing current away from the main transmission line a little while.

Q. Are those time-limited relay circuit breakers ever used in connection with distribution lines, distributing lines?

A. It is not, local distribution lines; no.

Q. You also furnish power to the Alaska-Juneau Co.?

A. We do.

Q. What kind of a circuit-breaker do you use on their line?

A. Instantaneous.

Q. How do you measure the power furnished them?

A. We measure the power furnished them simply by an ammeter and get the total kilowatt hours at a basin of 100 per cent factor on the current reading from the ammeter, and the total number of hours used.

Q. The same method is used that you employed in connection with the plaintiff's line to Sheep Creek?

A. In the method of measuring power?

Q. In the method of measuring power. A. Yes.

(Testimony of D. W. Proebstil.)

Q. And you used the same character of circuit-breakers? A. Same character.

Q. How many motors have you got continually at Treadwell approximately?

A. About 65, I should think.

Q. What kind of circuit-breakers do you use on the lines [338—271] to all of those motors?

A. The circuits or motors are controlled by instantaneous circuit-breakers, either a relay circuit-breaker or a fuse which is also instantaneous. On the smaller motors we use a fuse. On the larger motors we use instantaneous circuit-breakers.

Q. So your motors, your 65 motors, or approximately that number, except a few of the smaller ones, are controlled by the same kind of circuit-breakers that is in use in connection with the plaintiff company?

A. Same, yes; that is the same kind in the respect that it is instantaneous.

Q. Instantaneous. Now, what additional power, if any, is needed to start a form K motor?

A. Well, that depends on external conditions, but an inductive motor without even a belt on it always requires more than the normal starting current to start it.

Q. Approximately what per cent?

A. Anywhere from 50 to 250 per cent, depending on the condition of the rotor with respect to the stator.

Q. Always at least 50 per cent?

A. At least 50 per cent and from there on up to 250

(Testimony of D. W. Proebstil.)

per cent increase, that is above normal.

Q. The starting current required in one of these is that the same required in another, that is in the same motor?

A. No, it is not. Sometimes might be higher and sometimes might not be so high as I say, depending on the position—the relative position of the rotor and the stator.

Q. A starting current that would start a motor on one of these would not be current enough to start it on another [339—272] of these?

A. That is correct.

Q. Depending altogether on the relative position of the stator and rotor of the machine?

A. Of the machine, yes.

Q. In any event, the starting current would be 50 per cent additional?

A. Well, that is approximately.

Q. Approximately? A. 50 per cent.

Q. And from that it would run up to 250 per cent?

A. Yes.

Q. How long would that starting current have to be drawn from the power supply?

A. Well, that again depends on the external conditions. If the machine were belted, the machinery had a considerable amount of inertia, the starting current might rise in excess of the normal a period of a minute or a minute and a half, or it might be only a few seconds.

Q. What effect would that have—the drawing of such a starting current upon the—well, first, the—

(Testimony of D. W. Proebstil.)

your Sheep Creek is synchronized with your Nugget Creek plant? A. It is.

Q. And your steam plants at Treadwell?

A. Yes.

Q. At the present time how much is your Sheep Creek plant generating?

A. I had a report this morning about 400 kilowatts.

Q. 400 kilowatts, and how much is your Nugget Creek plant generating? [340—273]

A. Well, I imagine you can handle about 600 kilowatts there now and work right up to our water limit at that limit.

Q. How much are your steam plants at Treadwell generating?

A. Oh, somewhere in the neighborhood of 800.

Q. All those various currents are synchronized and used upon another system—in connection with another system of electric operation?

A. They are.

Q. And incoming peak from the Perseverance line, a starting current, would draw upon what?

A. Draw upon our steam plant.

Q. Upon your steam plant? A. Decidedly.

Q. How much such an incoming current or incoming peak produced by starting a form K motor in use at the Perseverance affects your supply of electricity and affects your operation in general, explain that?

A. Not only or during the time an inductive motor is started the supply of the Sheep Creek plant would merely be lessened with reference to what is supplied

(Testimony of D. W. Proebstil.)

from the Treadwell.

Q. What effect would that have upon your operation of your motors?

A. Well, probably have no effect upon the operation of the motors, except it would have upon the juice, simply upon the drawing from the other sources of power to meet that additional source that was demanded in starting.

Q. Well, suppose you are working your power up to the limit,—if you are working your motors up to the limit, Mr. Proebstil, what would the effect be on your motors, that is, if [341—274] you are using all the current generated?

A. If the starting effects were large enough, that is, the increase were large enough it might cause a sudden decrease in voltage. Sometimes a sudden decrease in voltage will cause a disruptive effect—the inductive motor, either the inductive motor has got to stand that disruptive effect or the circuit-breaker controlling the inductive motor must be released. We have had several instances of that and very lately too in which a sudden increase of current from our generator end of our system has caused inductive motors to get off the line, inductive motors that were working right up to the limit at our Treadwell plant.

Q. Now, Mr. Proebstil, in order to furnish a starting surge, say, of 300 horse-power, and something, first horse-power, what provision have you to make for it—the current is only used for a short time, but

(Testimony of D. W. Proebstil.)

what have you to do in order to furnish it for that short time?

A. You have got to have a generating capacity in reserve to meet that starting current. There is no telling how often that starting current is going to be imposed upon the system. It may be imposed upon there every minute.

Q. Is there any difference in the practical effect between furnishing 600 horse-power continuously and furnishing 300 horse-power with the provision of drawing an additional 300 horse-power momentarily for starting or any other purpose?

A. Very little.

Q. Very little.

A. In other words, you have got to be prepared at all times to meet that additional power required.
[342—275]

Q. Now, you have heard the testimony here with reference to wattmeters? A. Yes, sir.

Q. Can you measure your power delivered to the plaintiff company with a wattmeter?

A. You could.

Q. How would you do it? What would be the effect? Please tell the Court all about it.

A. A wattmeter is a device for measuring electric power. It measures the actual power delivered to a line or being consumed, the actual power being consumed in a line, in a circuit.

Q. Takes into consideration the power factor?

A. Have the voltage, the current, and the power factor, and the phase being a factor also—

(Testimony of D. W. Proebstil.)

Q. (By the COURT.) Your answer was interrupted. I didn't understand it. You said first the power coming to you and you said finally taken from. Now, which do you mean?

A. A wattmeter measures the power consumed in a circuit, to be a little definite—more definite.

Q. (By Mr. J. HELLENTHAL.) It has nothing to do with the power, the amperage drawn from the generating plant, it doesn't measure it?

A. No, it doesn't measure amperage; no.

Q. The only way you can tell what was drawn from the generating plant is to use a wattmeter, have to know what the power factor was and divide the result by the power factor; is that not true?

A. Well, the wattmeter registers the amount of power that one particular circuit draws from the plant, but if you [343—276] want to know what the amperage flowing through the circuit is, have got to measure that by an ammeter of course.

Q. Well, explain to the Court fully why you don't use a wattmeter down there at Sheep Creek; that is the quickest way to get at it, Mr. Proebstil—if I were to ask you the question direct—just explain to the Court in your own way why you don't use a wattmeter at Sheep Creek or why you do use the means you employ?

A. Because we are not supplying them an aggregate amount of power. It is only a reading of 300 horse-power and an ammeter is all that is necessary to do that or we need to know to determine the amount of power available within the limit of 300

(Testimony of D. W. Proebstil.)

horse-power is an ammeter because no other meter is necessary.

Q. Can there be any mistake about it?

A. Absolutely no mistake.

Q. A wattmeter doesn't exhibit—a curve reading wattmeter doesn't register a quantity of current taken at any one time? A. Real current; no.

Q. There is nothing in connection with the use of a wattmeter that would prevent any one taking an excess of current if they desired?

A. None whatever.

Q. If you had a wattmeter installed and 100 horse-power were taken one hour, five hundred another, 400 another, and so on, there would be nothing to prevent that sort of practice?

A. No, not from the wattmeter readings, no, certainly not.

Q. And the wattmeter then only shows you at the end of a given time the aggregate or average current that had been taken. [344—277]

A. Yes; the wattmeter would simply show the aggregate, in other words, integrates the power of the watts or kilowatts with respect to time.

Q. Is there anything in a wattmeter that would regulate the uninterrupted or continuous flow of current? A. Nothing whatever.

Q. Is there any other device known to electrical science except a circuit-breaker such as you have installed that would regulate it?

A. Not that I know of.

Q. Now, Mr. Proebstil, there is one matter I want

(Testimony of D. W. Proebstil.)

to go into a little what effect would the change of the power factor on the Sheep Creek line have on your operations?

A. The change of power factor, if the power factor were to decrease and the plaintiffs still draw their 300 horse-power, it would mean that we would have to furnish them additional current. That additional current would be deducted from the limit of the current which could be furnished by the generator. Hence, it would decrease the current furnished to our system by the same amount.

Q. Now to illustrate—

A. The power factors remaining the same.

Q. Now, to illustrate, Mr. Proebstil, the unity or 100 per cent power factor, you are furnishing the Perseverance Co. with 56, or with 100 horse-power at 56 amperes? A. 300 horse-power.

Q. 300 horse-power with a voltage of 2,300. Now, if that power factor were reduced to 56, what would the effect be upon you?

A. It would mean that it would reduce the available amperage [345—278] to our system by the amount of 56 amperes.

Q. Would you furnish them any additional current. Would the current furnished by you be additional? A. Certainly be additional current; yes.

Q. You heard the testimony given here with reference to horse-power—the drawing of the horse-power from the bus-bars and all that sort of thing?

A. I have.

(Testimony of D. W. Proebstil.)

Q. Being almost constant. What is there about that. How does the power factor in the Perseverance line affect your operations and affect your supply of electricity?

A. It cuts down our available supply of course.

Q. Every time the power factor in the Perseverance line decreases, your available supply is cut down by just that much? A. Decidedly.

Q. If the power factor in the Perseverance line should be decreased to one per cent, how many generators of the same character that you now have in use would you have to have in order to furnish them with the 300 horse-power?

A. Assuming such a condition possible it would require 19.

Q. And if from one per cent back up to 100 per cent then—your generating capacity—your supply of electricity is affected in proportion as the power factor goes up or down, is that not true? A. Yes.

The COURT.—I suggest now that we don't use any more illustrations. Both the electrical engineers are using about the same illustrations.

Q. (By Mr. J. HELLENTHAL.) A power factor of 50 per cent is [346—279] very possible?

A. Yes.

Q. That is not such an unusual thing? A. No.

Q. That doubles the amount of current required?

A. Yes, for a constant amount of horse-power.

Q. And decreases your supply by that much?

A. Assuming that our generator is working up to its current capacity, the limit of its current capacity.

(Testimony of D. W. Proebstil.)

Q. Assuming you are using all the power generated by your generator? A. Yes, sir.

Mr. J. HELLENTHAL.—That is all. You may cross-examine.

Cross-examination.

Q. (By Mr. SHACKLEFORD.) After a power plant is constructed, a generating plant, and a number of loads put on that power plant, the whole system of distribution then acquires a power factor.

A. I don't understand you.

Q. Very well; I will try and make myself a little plainer. You construct a plant, for instance, we will leave out the number of distributions, and you deliver power to a current, then if you carry, for instance, an inductive load— A. One circuit?

Q. One circuit, or one circuit with several feeders upon the circuit, that is possible, isn't it?

A. Yes; one circuit from the power-house, I understand you.

Q. Yes; one circuit from the power-house. Upon that line there is a power factor, that is possible? [347—280]

A. A power factor existing, yes.

Q. Would the power factor of the circuit influence the power factor of the generating plant,—doesn't it?

A. In that particular case the power factor of the circuit is the power factor of the plant; but technically speaking, the power factor of the plant is not the power factor of the circuit.

Q. Well, I am speaking common language about

(Testimony of D. W. Proebstil.)

the thing. If you were speaking, weren't speaking on the witness-stand, were speaking of power factor there, you would reach the determination of your power factor at that plant from the influence that the load had upon the plant, wouldn't you?

A. Yes, the conditions of the circuits determine the power factor of the plant.

Q. As a matter of fact, in an electrical circuit the conditions at both ends of the line influence one another? A. They do not.

Q. They don't?

A. The conditions at one end influence the conditions at the other only.

Q. The circuit is never influenced upon what end?

A. From the consumer's end only.

Q. From the consumer's end, so that when you speak of power factor and of using power factor in computations, you mean the influence that the consuming end has upon the plant?

A. Certainly.

Q. Yes. A. Has upon the circuit.

Q. Now, in that respect you have a power factor at Sheep Creek, haven't you? [348—281]

A. We have a resultant power at Sheep Creek; yes, sir.

Q. A resultant power factor, you mean?

A. A resultant power factor, but it isn't the power factor on the Perseverance feeder, I may add.

Q. No, because it is influenced by a number of other conditions? A. Exactly.

(Testimony of D. W. Proebstil.)

Q. It is influenced to a certain extent by the Perseverance feeder? A. It is.

Q. The ordinary operations when the water is very low, the question of the Perseverance feeder the principal influence on that circuit?

A. Influences it materially; yes.

Q. Well, isn't it the principal influence?

A. Well, according to my records it is and chiefly at this stage of the water.

Q. Well, I am asking you about the stage when the water isn't low, a fair average stage.

A. It is one of the influences.

Q. It is one of the influences? A. Yes.

Q. Now, that plant also feeds the Alaska-Juneau?

A. It does.

Q. On a separate circuit?

A. Separate from your circuit, yes.

Q. That it is taken off the main Treadwell circuit?

A. Yes, it is indirectly; that is taken from substations of that main Treadwell circuit, feeder that goes out to the substations and from those substations there are [349—282] distribution circuits.

Q. Now, where does that—where does the Alaska-Juneau line, for instance, for this tunnel near the town of Juneau, where does that break away from the main line?

A. Oh, down here near the sawmill. We have a substation there.

Q. Is that where the circuit-breaker is set?

(Testimony of D. W. Proebstil.)

A. We have a circuit-breaker there.

Q. How many horse-power do you deliver there?

A. I don't know exactly.

Q. Oh, approximately?

A. Oh, approximately, two or three hundred horse-power, I guess.

Q. Now, that circuit-breaker is set so that it will go out instantly at 300 horse-power?

A. I don't know as it is.

Q. Well, you don't know how it is set?

A. I do not.

Q. You know it is set so high that any ordinary starting surge won't affect it?

A. I know it takes care of the service there, yes.

Q. And that you don't have the trouble that you have with the Perseverance line, don't you?

A. We have no trouble.

Q. So that in effect the instantaneous circuit-breakers that you speak of on the line of the Alaska-Juneau or on the Treadwell's own line are set so high that in effect they perform the service of a time limited circuit-breaker set at a certain amount, perhaps perform more service, give a bigger service?

A. They meet the service that is demanded, yes.

[350—283]

Q. They are set high enough to prevent constant interruptions?

A. They are set high enough to prevent constant interruptions, yes, sir.

Q. What is the power factor of the Sheep Creek power plant? A. I do not know.

(Testimony of D. W. Proebstil.)

Q. Have you ever made any effort to ascertain?

A. I have, but it varies so greatly that it is not worth while to try to keep a check on it; sometimes down as low as 70 and sometimes above 90, depending, as I said before entirely on conditions at Nugget Creek and the Treadwell power-house; runs between 70 and 90, might even be above 90.

Q. Now, Mr. Hellenthal asked you a minute ago about an intergrading wattmeter, an intergrading wattmeter wouldn't tell you the amount of power drawn at any particular time?

A. Does not; gives you the aggregate.

Q. Is that the only kind of wattmeter there is?

A. It is not.

Q. What are the other kinds?

A. Indicating or wattmeter, which is the same thing.

Q. They will show—

A. That shows the instantaneous power.

Q. Well, then, there is a wattmeter that shows you the reading at any time?

A. The curve wattmeter?

Q. Yes.

A. It will show by a drawing on paper.

Q. It actually will indicate to you through a course of any [351—284] length?

A. Yes, by pencil or pen drawings on a chart.

Q. Now, what has become of the curve-drawing meter that was altered for the Gastineau circuit?

A. Been no such meter installed yet.

Q. I asked you what had become of the one that

(Testimony of D. W. Proebstil.)

was ordered for it?

A. We have just received it.

Q. When was it ordered?

A. I don't know, sir; that was before—

Q. It was ordered before you came there?

A. It was ordered before I came here, yes, sir, in so far as I know.

Q. When did you receive it?

A. About two days ago, about two or three days ago.

Q. On what boat?

A. I don't know. Whatever boat landed last. I don't remember what it was.

Q. You have a shipping receipt for it?

A. I suppose so.

Q. Do you know of any curve-drawing wattmeter that was ordered for that plant in the summer of this year? A. I do not.

Q. When you come over to-morrow I wish you would bring the shipping receipt showing the exact date of the arrival of that curve wattmeter. It is expected to put that curve-drawing wattmeter upon the Alaska Gastineau circuit, isn't it?

A. It is.

Q. Now, if you can only measure—if the only proper way to [352—285] measure that current is in the way that you have indicated, namely the measure by amperes, why do you propose to install the curve-drawing meter there?

A. For our own purposes and our records.

Q. What use is that information to you?

(Testimony of D. W. Proebstil.)

A. It is a matter of keeping track of the amount of power we have generated, the aggregate amount of power we have generated. I keep another record similar to that.

Q. When the power factor of the Gastineau Company is 70 and the amperes—the ammeter indicates 56, what will that wattmeter show?

A. Under those conditions it will show less than 300 horse-power of course.

Q. How much less? A. 30 per cent less.

Q. Yes. 210 horse-power won't it, Mr. Proebstil?

A. I can figure it out in just a minute if you will give me time, that is it, 210 horse-power.

Q. Mr. Proebstil, are you under the impression that the Gastineau load drawn from that bus-bar is unity power factor or ever has been?

A. I am not, sir; never said so.

Q. In fact you don't believe it has been?

A. I know it hasn't been.

Q. When was it you first went into the Sheep Creek power plant, that is professionally?

A. Oh, it was somewhere about the 3rd or 4th of December. I don't remember the exact date; probably the 4th or 5th.

Q. At what measure in amperes was the circuit-breaker set at that time? [353—286]

A. The circuit-breaker was set to drop at 100 amperes when I first went over to inspect it for that purpose, to inspect it, 100 amperes.

Q. And you immediately corrected it to 56?

(Testimony of D. W. Proebstil.)

A. I did.

Q. How did you proceed for the arrangement of your wattmeter?

A. The wattmeter had nothing to do with the change in the drop coil whatever—I didn't need the wattmeter to change that drop coil. Possibly on new batteries I will not consult it again. I say I did not need the wattmeter to change the drop coil. I have not consulted the wattmeter. It will not be necessary to consult the wattmeter.

Q. I understand that that is according to orders, isn't it, Mr. Proebstil? A. It is.

Q. You have been instructed to construe this contract in a certain way and set the circuit-breaker right at the plant? A. I have.

Q. So the circuit-brokeed won't be of any use except for your own personal knowledge?

A. My own personal benefit, that is all, yes. With a curve-drawing wattmeter—

Q. You answered a question of Mr. Hellenthal's a little while ago in which you said that the wattmeter would indicate the horse-power or the kilowatts delivered at your bus-bar?

A. Into the circuit.

Q. Into the circuit?

A. That is an intergrading wattmeter, yes.

Q. Would indicate that? [354—287]

A. Horse-power or kilowatt hours.

Q. Well, there would be no difference in what would be indicated by an intergrading wattmeter and what would be indicated by either of the other

(Testimony of D. W. Proebstil.)

kinds? A. Oh, yes.

Q. In watts?

A. An intergrading wattmeter takes into account the time element and gives you the aggregate. The indicating wattmeter gives you the momentary peak.

Q. I know, there is a difference in the final results as you read them? A. A decided difference.

Q. But with a curve-drawing wattmeter that would indicate— A. Instantaneous peak.

Q. The horse-power delivered to that bus-bar to the Alaska Gastineau service?

A. Under the external conditions, yes, sir.

Q. And that is the only method whereby you can determine the actual as distinguished from the theoretical horse-power delivered into that circuit, isn't it?

A. There is no difference between the actual and the theoretical horse-power.

Q. None whatever? A. Absolutely none.

Q. Then there would be no difference in the reading of the ammeter and the reading of the wattmeter; that is to say, your ammeter would read 56 whenever that wattmeter read 300 horse-power?

A. That is not to be inferred whatever from my statements. [355—288]

Q. Well, why isn't it to be inferred from your statements when you say there is no difference?

A. Because the power factor is a part of the theory by which you determine the power. That is

(Testimony of D. W. Proebstil.)

a case in which the practical results confirm the theory exactly.

Q. Well, then, practically speaking, although we don't get at your bus-bar 300 horse-power, you deliver it?

A. I have made no such statement whatever.

Q. You don't claim that you have delivered 300 horse-power to the bus-bars?

A. I do not. We claim it is available.

Q. It is available, that is right? A. Yes.

Q. In a contract which contemplates the actual use, beneficial use, exercise *an* enjoyment of 300 horse-power, what would you use a wattmeter for?

A. I am not discussing contracts. I have been instructed not to discuss contracts.

The COURT.—This is a question of measuring.

Q. (By Mr. SHACKLEFORD.) Very well, I am assuming—I am not asking you to discuss the construction of this contract: I am assuming that this or any other contract that I refer to in this question contemplates the beneficial use of 300 horse-power; assuming that to be the fact, how would you measure that delivery—by the wattmeter or the ammeter?

Mr. J. HELLENTHAL.—Now, your Honor, we object to that question. In the first place, the witness wasn't permitted to go into this matter; and in the second place [356—289] no such contract in this case; assuming a hypothetical question away outside the question that he answered.

The COURT.—I am interested in the way current

(Testimony of D. W. Proebstil.)

can be used and measured.

A. (By the WITNESS.) Always measure current by means of an ammeter. No other means of measuring current. No other practical way except by an ammeter.

Q. (Read by the REPORTER.) I am assuming that this or any other contract that I refer to in this question contemplates the beneficial use of 300 horse-power; assuming that to be the fact, how would you measure that delivery—by the wattmeter or the ammeter?

A. Well, the method in use—that 300 horse-power were in—that 300 horse-power would have to be specifically stated in the contract before I would define the method of measuring it. That is my answer.

Q. (By Mr. SHACKLEFORD.) Well, I am assuming if you and I had entered into a contract. We will lay this aside, the fact that we are in the courtroom at all.

A. All right.

Q. And you agreed to give me the beneficial use—

A. Beneficial use, I understand; yes.

Q. —of 300 horse-power?

A. Under what conditions?

Q. Well, that is the end of it.

A. I couldn't give you any answer to that whatever.

Q. You couldn't?

A. I could not because it *it* is absolutely impossible to determine the method of measuring that partic-

(Testimony of D. W. Proebstil.)

ular use of the contract unless I know the conditions at which you receive it. [357—290]

Q. Absolutely impossible?

A. No, you will have to state the voltage; have to state the power factor that you expect. Now, if you state the voltage and the power factor that is expected, I will tell you how to measure it.

Q. All right. I will state to you that it is a voltage of ordinary use, 2,300 volts, is an ordinary voltage, and it is a power factor such as commonly used in connection with the operation of form K motors.

A. You will have to make it more definite.

Q. You refuse to answer the question under any of the conditions?

A. I refuse to draw up a contract unless it is specifically stated.

Q. Well, I am not asking you to draw up a contract. A. I understand.

Q. I want you to say how that power would be measured from the standpoint of fairness and efficacy in view of the fact that the parties who made the contract had been foolish enough not to specify the exact conditions under which the power was to be delivered.

A. If the conditions were not specified, I would most certainly assume a power factor of 100 per cent and not allow peaks.

Q. And deprive the party, assuming he installed an ordinary form K motor, of that much power?

The COURT.—Well, this question has developed

(Testimony of D. W. Proebstil.)

into something that I refused to let the defendants' attorneys ask.

Mr. J. HELLENTHAL.—I am not objecting.
[358—291]

The COURT.—I know you are not. * * *

Q. (By Mr. SHACKLEFORD.) I will ask one more question, your Honor. Do you mean to say, Mr. Proebstil, that under those conditions you would not use a wattmeter to measure that power?

A. I might use a wattmeter to measure the power for my own information, but to determine the limit to which you could draw it, would certainly use another instrument.

Q. Mr. Proebstil, what is a recognized unit of measurement of power?

A. Mechanical or electrical?

Q. Well, this is a case concerning electrical power.

A. A watt, or the kilowatt.

Q. (By the COURT.) How do you spell your name? A. P-r-o-e-b-s-t-i-l.

Q. (By Mr. SHACKLEFORD.) Now, the recognized unit in steam power is horse-power?

A. It is.

Q. A horse-power—what is the recognized equivalent of a horse-power in watts?

A. 746 watts are equivalent to one horse-power; so decided on by the American Institute of Electrical Engineers.

Q. Now, it is common in ordinary discussion and in ordinary practice to discuss electrical power in the terms of horse-power? A. It is.

(Testimony of D. W. Proebstil.)

Q. Mr. Proebstil, wherever there is an alternating current circuit with an inductive load on it, the element of power factor enters into the question of the real power delivered? [359—292]

A. Wherever there is a circuit with an inductive load, the power factor does enter into the power on that circuit.

Q. The same situation, except perhaps in a difference of wording of the contract or something of that sort, concerning which we will not bother this morning, exists on the Alaska-Juneau circuit?

A. There is an inherent inductive characteristic in the Alaska Gastineau circuit due to the particular type of apparatus that are installed on that circuit.

Q. There are inductive motors used on that circuit, is that true? A. Yes.

Q. That is true also of machinery used in the various Treadwell mines? A. It is.

Q. So that you have no circuit running from any of your power-houses in which the element of power factor is not involved when the question of real as distinguished from apparent power is under discussion?

A. The element of power factor enters into all the measure of power actually consumed in these circuits; yes, sir.

Q. There are two stations on the Alaska-Juneau circuit, as I understand it? A. How is that?

Q. Two places of consumption on the Alaska-Juneau circuit?

(Testimony of D. W. Proebstil.)

A. You mean on the Sheep Creek-Treadwell circuit?

Q. No; I mean on the Alaska-Juneau circuit.

A. We have two points at which we take power from the Sheep Creek-Treadwell power, feeding power to the Alaska-Juneau mine, yes. We have two substations on which that line connects. [360—293]

Q. By substation you mean transformer?

A. I mean a transformer substation, yes.

Q. You mean by that there is nobody stationed there—it is not a house?

A. A substation doesn't imply an operator for it.

Q. Well, I just want to get the sense of it, so I can understand myself. A. Yes.

Q. Now, at one of these substations the circuit is connected with a motor at the first substation, the one nearer the town of Juneau—the circuit is connected with a motor of what capacity?

A. I believe that is a 150 horse-power motor on the compressor.

Q. 150 horse-power motor on a compressor?

A. I believe so.

Q. Is that an inductive motor?

A. It is. Type M—

Q. Nevertheless it is an inductive motor and into that circuit enters the element of power factor?

A. Yes.

Q. Nevertheless you have another feeder which runs to what is known as the Snowslide Gulch tunnel?

(Testimony of D. W. Proebstil.)

A. Yes. I want to see that you are clear on that. You mean that our feeder runs that far? It runs in that direction. We have an auxiliary feeder from our substation from there, yes.

Q. Well, you have a branch line from your main line?

A. Up into the Gold Creek Basin, up here to our substation, and from there have distribution feeders, yes, running to the Gold Creek tunnel. [361—294]

Q. Now, is that circuit connected with an inductive motor? A. It is.

Q. What is the size of that motor?

A. 150, I believe.

Q. What does that motor run?

A. A compressor.

Q. Anything else?

A. That is all; just a compressor.

Q. Do you find that motor adequate for that compressor? A. No, it is too small.

Q. You have ordered a new motor to run that compressor with?

A. I believe so, yes. A new motor ordered for that purpose.

Q. An inductive motor? A. It is.

Q. Recently ordered?

A. I don't know the date it was ordered. That is a part of the business with which I have nothing to do, in fact it was ordered before I took charge.

Q. Ordered before you took charge? A. Yes.

Q. But it hasn't arrived?

A. No, it hasn't arrived.

(Testimony of D. W. Proebstil.)

Q. Have you seen that compressor?

A. I saw it, yes, in the dark.

Q. You know, as a matter of fact, Mr. Proebstil, that is the compressor that was operated by the Sheep Creek power plant before the new plant was put in?

A. I do not. I don't know anything about the history of that compressor at all. I know it is up in the new Gold Creek tunnel operating. [362—295]

Q. You haven't the slightest idea?

A. I say I know nothing of its history whatever.

Q. You haven't heard anything of its history?

A. No.

Q. All right, we will get that history. Now, in questioning you hereafter, Mr. Proebstil, I am going to proceed upon the theory which the Court must decide one way or the other, but I am going to proceed hypothetically upon the theory that this contract deals with the actual and not apparent power, and you can understand that assumption.

A. I understand that is your assumption; yes.

Q. In every one of the questions which I ask?

A. All right.

Q. Assuming that to be the case, and assuming that an inductive load is carried at the Perseverance Mine with 56 amperes at 2300 volts, and further I should say at your bus-bar, and drawn over that circuit, there is not delivered in actual power 300 horsepower, is there?

A. According to your assumption with the inductive load there is not. It would be less, according to

(Testimony of D. W. Proebstil.)

the power factor that exists under the conditions that you have stipulated.

Q. Now, then, assuming that power factor to be 70, there would be 90 horse-power undelivered, wouldn't there?

A. Can tell you in just a moment. At 70 per cent power factor with the conditions you have stated there would be 210 horse-power actual power delivered, which lack 90 of the 300.

Q. Now, under those conditions—

A. That is a condition of 70 per cent power factor.

Q. Now, under those conditions included in the last question [363—296] with the circuit-breaker set at 56 amperes, where would the actual power go—the 90 actual horse-power, assuming that you are dealing with a plant, not as a plant of an apparent capacity but of a plant of an actual capacity, under the practical conditions existing, assuming that we are entitled to 300 actual horse-power, where would that 90 horse-power be going?

A. Under the condition that there is a 70 per cent power factor existing?

Q. Yes, sir.

A. Wouldn't be developed anywhere. Wouldn't be going any place, anywhere.

Q. If you had your steam plant shut down and were running to capacity, it would be developed upon the circuits of the Treadwell?

A. What do I understand you to mean by capacity—if we are running to capacity, of the generator over there, do you mean?

(Testimony of D. W. Proebstil.)

Q. Yes.

A. Well, it would mean we would be getting just 90 horse-power less capacity out of our generator inasmuch as we couldn't exceed the current rating of our generator; in other words, we would be deprived owing to the fact you are operating a 70 per cent power factor, we would be deprived of 90 horse-power. Likewise you would not be receiving 90 horse-power which you could be receiving if you would better conditions on the receiver end.

Q. By bettering conditions, you mean that condition—

A. By bettering conditions I mean a higher power factor.

Q. You mean a unity power factor? You mean a condition that [364—297] doesn't exist on any of your own lines at the present time? A. I do.

Q. And you want the Court to understand that an actual horse-power—that although we lose, actually lose 90 horse-power under the assumed conditions and at the same time you are dealing with actual power all through the thing, and not apparent power, that you are not getting the 90 horse-power?

A. Certainly we are not getting it.

Q. I am assuming that that plant, taking into consideration all those circuits, is capable of delivering a certain amount of actual power? A. Yes.

Q. Not apparent? A. I understand.

Q. And that we are deprived of 90 horse-power by your ammeter setting the use of the electric supply of that plant, you want the Court to understand that

(Testimony of D. W. Proebstil.)

you don't get the 90 horse-power?

A. Here are the conditions exactly. If our generator were operating at normal condition, we will assume that our generator is operating on the bus and the external conditions are such that our resultant power factor of that machine is 85 per cent power factor, then with 294 ampere consumption from the generator, we would be delivering 1000 kilowatts of 1330 horse-power.

Q. That is apparent? A. Actual.

Q. Actual?

A. Certainly, 1,000 kilowatts is equivalent to 1330 horse-power [365—298] now there would be a certain per cent of that 294 amperes that would be delivered to your service—56 amperes—that 56 amperes would represent $56/294$ ths of the actual power that was actually being delivered to the bus-bars from that particular generator.

Q. You are talking now of amperes now, aren't you?

A. In case the power factor is constant, the power is proportional to the amperes. Now, regardless of the power factor that you maintain over your service, we have got to continue furnishing this 56 amperes; in other words, there would be no more than 56 amperes subtracted from 294—divided by 294, that fraction of the total 1330 horse-power available for our own use.

Q. Well, now, let's get at it in another way.

A. In other words, we do not get that 90 horse-power which you lose owing to the inefficiency of the

(Testimony of D. W. Proebstil.)

apparatus you have installed. Is that plain?

Q. Yes, it is so plain, I think we can get at it in another way. Suppose the Court should construe the contract and order us and enter an order which would give us actual power under the conditions now existing with our inductive motor, and you then set your ammeter to give us 300 actual horse-power, by watt measurement, then you don't want the Court to understand that under those circumstances the defendant companies would not lose 90 horse-power which is available to them under the present conditions?

A. The power factor—before that circuit-breaker could be set to any degree of intelligence whatever that power factor would have to be known, have to be determined.

Q. I am assuming the power factor. You needn't bother with [366—299] that, Mr. Proebstil.

A. All right. Why, certainly under the present conditions you would be losing whatever the difference was between the actual power consumed and the 300 horse-power; in other words, you wouldn't be losing, but you wouldn't be getting it—the difference between losing a thing and getting it.

Q. Well, you have got to have it first before you can lose it?

A. You have got to have it before you can lose it, yes.

Q. But we are losing it when we don't get anything that we are entitled to?

A. My answers, you understand, are all upon the

(Testimony of D. W. Proebstil.)

assumption that you are entitled to—

Q. Actual power? A. Yes.

Q. Now, assuming that power factor to be 70, how would your ammeter be set?

A. 80 amperes, if 70 per cent power factor were agreed upon the drop coil would have to be set at 80 amperes.

Q. At 80 amperes. Have you any recording curve drawing ammeters?

A. Not a one on the system.

Q. Have you any ammeters other than indicating ammeters? A. We have not.

Q. Will you explain the method under which the power given to your friends—the Alaska-Juneau Co., is computed?

Mr. J. HELLENTHAL.—Now, your Honor, I don't care—I'd just as soon have them ask how this power is measured, but I don't want to go into this case any feeling between the Alaska-Juneau Co. and the Alaska-Treadwell. The question of the relationship between those parties is [367—300] something that doesn't concern any of the parties in this case, whether it is computed by means of a wattmeter or ammeter.

Mr. SHACKLEFORD.—I want to get the exact method by which you treat your other consumers.

Mr. J. HELLENTHAL.—None of your business how we treat the Alaska-Juneau.

Mr. SHACKLEFORD.—I think it is an illustration of what their practice is.

The COURT.—You may answer the question so

(Testimony of D. W. Proebstil.)

far as the instruments are concerned.

A. (By the WITNESS.) The only instruments we have on our service for the Alaska-Juneau people is ammeters and we have a log, a running log, kept of each of our services which gives us the number of hours and we multiply the number of hours by the amperage by the voltage by 100 per cent power factor by the safety factor, which gives us our actual kilowatts, divided by 1,000 gives us our actual kilowatt hours, in other words, we base all of our power consumption on that 100 per cent power factor.

Q. (By Mr. SHACKLEFORD.) Who keeps that log, the Alaska-Juneau?

A. The Alaska-Juneau Co. themselves.

Q. How often are the observations taken?

A. Whenever our motor is running, whenever the motor is hitched up, the time is set down when that motor is running during normal operations, the current is read, not minimum or maximum.

Q. During normal operations? [368—301]

A. During normal operations.

Q. How often is it read?

A. Well, probably once a day; in other words, the maximum current is read. As a matter of fact, that maximum current from one day to another is constant.

Q. Well, the maximum is read if you happen to read it at a certain time?

A. The maximum normal.

Q. I say that is read if you happen to read it at the right time?

(Testimony of D. W. Proebstil.)

A. I explained you know that the log of the compressor—have explained already that thing this morning, the compressor load is practically constant; therefore the current is practically constant.

Q. What about the—is the log of the instrument read—is the log made at the instant of the starting surge?

A. It is not, no; that hasn't anything to with our results that we know of.

Q. Now, how do you charge for it?

A. That is a point out of my jurisdiction whatever.

Mr. J. HELLENTHAL.—Just a minute. We object to that. Doesn't concern you.

Mr. SHACKLEFORD.—I think it is apparent, if your Honor please, that counsel doesn't want to go into the question, but it seems to me fair to demonstrate the method in which they treat other consumers and ascertain that.

Mr. J. HELLENTHAL.—I withdraw the objection. Go into it.

Q. (By Mr. SHACKLEFORD.) How do you charge for it?

A. Charge per kilowatt hour. [369—302]

The COURT.—I will expect some discussion on the part of the attorneys in going into the matter.

Q. (By Mr. SHACKLEFORD.) All right. Charge per kilowatt hour from an ammeter reading?

A. From ammeter readings based on 100 per cent power factor.

Q. Based on an average of the readings?

A. Average readings. The number of hours running.

(Testimony of D. W. Proebstil.)

Q. Yes.

A. And 100 per cent power factor.

Q. And without any intergrading wattmeter?

A. We have no such meter on our service whatever.

Q. And no charge is made for the surge, the extra peak consumed in the surge?

A. Not that I know of.

Q. That is a portion under your present system of—under your present regular current system that takes the power not only from the Sheep Creek plant, but from the steam turbine at Treadwell and from your plant at Nuggett Creek?

A. It is possible to maintain that service all over from any one of the three plants.

Q. But, as a matter of fact, as it is maintained, it takes power from the three plants?

A. Well, as a matter of fact, under normal conditions, it takes power from the Sheep Creek plant.

Q. That is in the summer-time? A. Yes.

Q. At the present time?

A. It is taken from there at present.

Q. And it is not intermixed in any way with the current from Nugget Creek or the turbine? [370—303]

A. Depending on the various conditions, because they sometimes draw current from these other places.

Q. They do? A. Occasionally, yes.

Q. Aren't these other places on the circuit with that?

A. That is just what I have stated that it is possible instantly to draw from these other places.

(Testimony of D. W. Proebstil.)

Q. Under your present arrangement, as a matter of fact, you don't know what plant it is drawing power from? A. No, certainly not.

Q. Now, assuming the same conditions as I assumed a moment ago in that question—

A. Regarding the power factor?

Q. Regarding the power factor. That your generators are not running to capacity, for instance, that there is 500 horse-power at Sheep Creek and that you have your water all turned on, and we are dealing with the question of actual power, not apparent power, and we are taking only 210 horse-power in actual horse-power, where does that other 90 horse-power go?

A. In that particular case it would go into our service.

Q. Now, well that represents the normal condition, doesn't it?

A. Why, no, it doesn't. It represents a specific condition. Not normal, specific condition; specific conditions are never in any way normal conditions.

Q. Well, the condition which I stated would represent, assuming this other question of actual not apparent power was involved in the thing, that condition, Mr. Proebstil, would exist very likely under ordinary conditions two or three hundred days out of the year, wouldn't [371—304] it?

A. I don't know how many days it would exist, depending entirely on our demands for power from that plant.

Q. You don't demand the 90 horse-power only at

(Testimony of D. W. Proebstil.)

those times when you are demanding from that plant your utmost capacity? A. How is that?

Q. You don't demand the 90 horse-power under the conditions named—we would get the 90 horse-power under the conditions named except when you are running that generator to its utmost capacity?

A. Not all of the 90. It would have to be some point between full capacity and certain definite point below; might get a portion of the 90.

Q. Would get a part of it at least?

A. Yes, would get a part of it at least when running to capacity, yes, that is true.

Q. How much time, Mr. Proebstil, does that plant run at 1,000 kilowatt capacity?

A. Well, during low water very seldom, seldom runs at 1,000 kilowatt capacity during low water; in the higher stages of the water of course we endeavor to keep the machines loaded as full as we can.

Q. There are two machines there, aren't there, Mr. Proebstil? A. There are.

Q. Most of the time only one of them is running?

A. Never run the two unless it is necessary.

Q. (By the COURT.) You mean two generators?

A. Yes, sir, two generators.

Q. (By Mr. SHACKLEFORD.) Now, in handling the surges, let's [372—305] see, how much of a peak you have on the Alaska-Juneau circuit, approximately how much of a peak do you have on the Alaska-Juneau?

A. In handling—what was that question?

Q. I will repeat the first part of the question—I

(Testimony of D. W. Proebstil.)

will withdraw it rather—how much of a peak do you actually deliver, approximately speaking, to the Alaska-Juneau circuit on the average?

A. Well, we have two distinct circuits.

Q. You have two distinct circuits, that is to say, the wire?

A. Yes, we have a service on this side of the mountain and one on the other side, one on the other side of this ridge I should say.

Q. They are separate from the—they are taken off the main wire from Sheep Creek at different points, are they? A. Yes.

Q. All right; well, in any one of them you shortly expect to install a 200 horse-power motor?

A. I believe that is it; yes.

Q. Have you any larger motors in operation on any of your circuits? A. We have.

Q. What is the largest motor you have in operation?

A. I believe the largest motor we have is a 400 horse-power.

Q. Where do you use that, in what operation?

A. It is used in connection with one of the stamp-mills at Treadwell.

Q. That is in starting one of the stamp-mills?

A. In operating one of the stamp-mills, yes.

Q. Starting and operating. Of course, in starting a stamp-mill [373—306] you use every effort possible to keep the starting load down? A. We do.

Q. By friction?

A. Or some means by which the stamps will not

(Testimony of D. W. Proebstil.)

start at the time the main line is.

Q. Nevertheless you have a considerable, you have a considerable starting load from that operation?

A. Notwithstanding it is a type of motor familiar to the general electric type M would have all those external results involved in the starting element.

Q. Nevertheless you have a considerable starting surge? A. Considerably more than normal.

Q. Do you know how much that is?

A. I do not know, because it varies anywhere from 50 to 100 per cent, making every condition as liberal as possible in starting the motor, our own motor will start a rush of current under ordinary conditions.

Q. Do you know how much your starting surge is on the Alaska-Juneau current?

A. I do not know; in fact, I never have been there when any of the motors were started.

Q. If from a practical standpoint, considering the size of your plant, the question of a starting surge for a motor under 300—under 400 horse-power, the difficulty with a starting surge is it is more or less theoretical than practical, isn't it?

A. There is no such thing as a starting surge. The term is not admitted of in electric practice at all. The surge is not used in that sense.

Q. You understand what I mean by that? [374—307]

A. When you use the word "surge" I do not.

Q. When I asked you a question a moment ago about your own motor you understood the word "surge"? A. You didn't use the word "surge."

(Testimony of D. W. Proebstil.)

Q. Very well, I may not have.

A. Why, if I understand you to mean by the word "surge" the starting current I can understand.

Q. Very well, call it that, just to please you. Now, then, just from a practical standpoint, considering the size of your plant and your situation, the question of starting a 300 or 400 horse-power motor of any ordinary type is not a serious question practically?

A. It is this serious that under our present operating conditions if one of the motors that I speak of happens to be idle and the steam plant not running, that we take precautions to get one of our 1000 kilowatt generators on our bus before we attempt to start that 400 horse-power motor under the conditions I have stated.

Q. Calling your attention to the fact that even when it is needed or the steam plant is not working, you are running the other plant up pretty close?

A. We are running up pretty close.

Q. Most of the time, Mr. Proebstil, you have adequate power, you have the other plant running and if any question of being near the margin, you have got your steam plant ready to work?

A. Yes, in readiness to run, if not running.

Q. It would be a risky and serious thing for you to continue to carry the lines all practically up this close to the margin without having the auxiliary apparatus ready? [375—308]

A. In other words, an auxiliary apparatus would not be auxiliary unless it were ready.

(Testimony of D. W. Proebstil.)

Q. Was there any auxiliary installed when you put on the Alaska-Juneau current, any additional auxiliary?

A. I do not, *no* sir; those connections were all made before I arrived. As I understand it, however, the steam plant was installed before the Alaska-Juneau was connected on to the Treadwell, although when at the Sheep Creek plant I understand that the Sheep Creek plant and the Treadwell plant were put in about the same time.

Q. The steam plant is of ample capacity and is built for the purpose of taking care of the ordinary or necessary overload that may come upon you?

A. It is.

Q. And from the standpoint of danger, practical danger of the capacity to handle the situation, the load of a 300 or 400 horse-power motor isn't an element from a practical standpoint?

A. Not a very big element.

Q. And in speaking of a load, you understand, that I speak of it in the sense of a starting load?

A. I understand.

Q. Now, there has been a good deal said here about synchronous motors. How many synchronous motors installed on any of the mining plants in this vicinity that you know of?

A. So far as I know, no synchronous motors installed at the present moment.

Q. You don't know of any having been previously installed in the neighborhood of 1909, do you?

A. I know nothing about the operations in this

(Testimony of D. W. Proebstil.)

vicinity prior [376—309] to August 1st, when I arrived here; since August 1, 1912, I have been here.

Q. Now, the load at the Perseverance Mine is an ordinary mine load, assuming it is run for the purpose of running a compressor, underground development and such things as are necessary to the plant, that is an ordinary mine load?

A. I presume so, yes.

Q. It is impossible with an inductive motor on that load to have unity power factor?

A. With an inductive motor it is impossible, because it has an inherent phase displacement which is a characteristic of all inductive motors?

Q. Now, *with* the installation of a synchronous motor on that line increase the actual amount of power delivered to us?

A. At the rated voltage, and did I understand you installed in place of the inductive motor?

Q. Yes, I think so. A. Why, certainly.

Q. Wait just a moment. Assuming, Mr. Proebstil, that we are entitled to 300 horse-power under ordinary mining conditions with an inductive load and was getting it, would the addition of a synchronous motor in that load add any power?

A. It would make it possible to derive more power under the same current draft from the bus-bars, for the simple reason that synchronous motors have what is known as a rotary condensive effect, and that condensive effect is controllable at the motors. It can be so adjusted to operate at unity power factor, or it can be so adjusted to operate at a leading power

(Testimony of D. W. Proebstil.)

factor which at all times [377—310] counteracts a lagging power factor. If you had a leading power factor of a certain per cent and a lagging power factor of a certain per cent and the current of one was equal to the other, the resultant power factor would be unity; in other words, your synchronous motor can be so adjusted as to counteract, by giving it a leading power factor, the lagging power factor of the current drawn by an inductive motor and the resultant power factor would be unity on your line.

Q. It would approximate unit power factor?

A. It can be so adjusted if you had an instrument—well, it would be held exactly at unity power factor.

Q. Is that a thing that can be corrected anywhere except at the motor?

A. That is a thing that can be corrected anywhere along your transmission line.

Q. Can it be corrected at the power-house?

A. It can be corrected not on the bus side of the feeder, but it can be corrected on the line side; that is a point within your control, not ours.

Q. Well, you could place right in your own power-house a machine that would rectify that situation without placing it at the Perseverance Mine?

A. We could not.

Q. You could not?

A. No, could not. It would have to be a different type of synchronous motor placed in the plant there and it would only rectify the current from that point only towards the bus-bar.

Q. Only toward the bus-bar?

(Testimony of D. W. Proebstil.)

A. Yes. [378—311]

Q. Did not your answer a moment ago—simply, you mean that our motor was actually placed just on the side of the bus-bar away from your plant?

A. No; this synchronous motor should be placed with that terminal, with your inductive motor.

Q. With the inductive motor—the inductive motor station?

A. Well, you have—you would have two motors, have two motors, one inductive motor and another synchronous motor; and the inductive motor by drawing the inductive load, a leading current; while the synchronous motor can be used to draw a lagging current, and one would counteract the other.

Q. And that could only be done at the plant where the power is consumed? A. How is that?

Q. That can only be done at the point where the power is consumed?

A. That is the most effective place, certainly.

Q. I understand that is the most effective place, but I understood you a moment ago that it could take place anywhere along the line

A. It could along the line, but it would only correct the power circuit on the circuit between the placing of the synchronous motor and the source, the point out on the line.

Q. Could that be done at the gas plant?

A. Yes, you can correct the power factor on the line leading back to the line.

Q. Would that correct the general situation pro-

(Testimony of D. W. Proebstil.)

vided the power is used at the Perseverance? [379—312]

A. Would help the situation out between those two points; as I said before, the most effective place is to put the synchronous motor at your inductive motor.

Q. But, as a matter of fact, you could approach it by affecting any place on our line?

A. You could help it out.

Q. Well, you could approach it being affected by placing the motor in your power-house this side of your bus-bar? A. No.

Q. Why not?

A. It would, because, as I said before, the power factor of a line depends on the inherent inductive characteristics of that circuit. Now, if you put the synchronous motor at the power-house it does not become a part of your service.

Q. Well, let's see; could you put it immediately outside your power-house?

A. Then it would only correct the power factor of that very short piece of line and which would not do you very much good.

Q. Not do you very much good?

A. Well, as I said before, the most effective place to put the synchronous is at the point of your peak.

Q. Do you know what the difference is?

A. Practically proportional to the length of your line.

Q. It would? A. Yes.

Q. It is not the practice to synchronize from the power-house?

(Testimony of D. W. Proebstil.)

A. You are now using words that don't apply to that form of question whatever.

Q. Well, it is not the practice to use a machine which will [380—313] accomplish the same effect in synchronizing at a power-house, is it?

A. It is never practical to use a synchronous motor for correcting the power factor at a power plant, because they use it at the consuming end.

Q. Now, then, Mr. Proebstil, we will assume that we are getting 300 horse-power, actual real horse-power—

A. Under what conditions?

Q. At 70 per cent power factor. A. All right.

Q. And that this would require 80 amperes?

A. It would.

Q. If we substitute a synchronous motor and still use 300 horse-power, what would the amperage be?

A. At what power factor?

Q. At 70 per cent. I will just repeat the question.

A. All right.

Q. Assuming that we are getting 300 horse-power, actual horse-power, at 70 per cent power factor, it would require 80 amperes as stated, and if we substituted a synchronous motor and still drew 300 amperes— A. 300 horse-power.

Q. 300 horse-power at unity power, what would the amperage be? A. 56.

Q. Fifty-six?

A. That is assuming, of course, that your line was inductive—the inherent inductive characteristics of the line were unity power factor, which could be possible.

(Testimony of D. W. Proebstil.)

Q. Would this latest condition require any more prime mover, that is to say, any more water? [381—314] A. No, it would not.

Q. (By the COURT.) You say the line was unity inductive?

A. Well, a good many ways of constructing a transmission line.

Q. Are you familiar with this line?

A. No, not at all. I know it is an aerial line; that is all. I don't know the actual distance of the wire or the size of the wire or the conditions.

Q. (By Mr. SHACKLEFORD.) Well, then, in either case the amount of prime mover required to produce 300 actual horse-power would be the same?

A. Yes, practically the same with the exception of little variations in transformer losses, or the machine, due to conditions of the current, would be slight.

Q. Mr. Proebstil, here is an affidavit in this case signed by you, as follows: "Proebstil, being first duly sworn on oath deposes and says: He is chief electrician for the defendant companies and as such electrician he has charge of all the electrical workings and arrangements of the defendant corporations; that he is familiar with the circuit-breaker installed at the Sheep Creek power plant by which the current furnished the Alaska-Gastineau Mining Co. is produced; that said circuit-breaker will not go out unless more than 300 horse-power is being consumed by the plaintiff company." A. Yes.

Q. Now, in that affidavit you refer only to the conditions with relation to apparent power?

(Testimony of D. W. Proebstil.)

A. Only to conditions with relation to unity power factor, yes, sir.

Q. Now, Mr. Proebstil, as a matter of fact, the 56 amperes [382—315] under the present conditions—

A. Just a minute. I beg your pardon; that says a current of 300 horse-power, does it not?

Q. No, "unless more than 300 horse-power is being consumed." Doesn't use the word "current." As a matter of fact, Mr. Proebstil, under the present conditions, with the circuit-breaker set at 56 amperes, dealing with your power, you know that we cannot receive 300 horse-power.

A. Not at the conditions that you have established on the outside; no.

Q. And that refers to what we receive at the circuit-breaker? A. Yes, sir.

Q. And not to line losses and losses which occur between that point and the point of consumption?

A. It does.

Q. A wattmeter set at the circuit-breaker would measure the actual power delivered at that point, wouldn't it?

A. What kind of a wattmeter, please?

Q. Well, a curve drawing wattmeter would indicate the thing by a chart.

A. Instantaneous peak reading of it?

Q. Instantaneous peak readings of it, and by a continuous curve it would indicate the history of the whole delivery? A. It would; yes.

Q. An intergrading wattmeter would indicate the

(Testimony of D. W. Proebstil.)

total amount of horse-power consumed in a meantime without showing the variations in the load?

A. Yes, it would give you the aggregate kilowatt hours.

Q. A curve drawing wattmeter set at that point would indicate speaking in terms of actual and not apparent power, the actual power [383—316] delivered at the bus-bars at any one moment or any period of time, because it carries a continuous record?

A. Gives you a complete history of all the instantaneous readings.

Q. It would show the actual power delivered?

A. It would.

Q. And it is the only way of ascertaining the actual power delivered; the only practical way of determining the actual power delivered, isn't it?

A. It is the most practical way; yes.

Q. And when it is set there upon that panel in your power-house it measures the actual power going out over that current, doesn't it?

A. What is that term, current or circuit do you mean?

Q. Over the circuit? A. Yes.

Q. Now, it does not measure the actual power available at the Perseverance Mine nor it is not affected by the line loss, is it?

A. Not at that point, certainly not.

Q. No. Now, Mr. Proebstil, if your affidavit according to your construction, if your affidavit had used the word "current" you would have been within

(Testimony of D. W. Proebstil.)

the exact truth in that affidavit?

A. It doesn't use the word current.

Q. I say if it had. A. Yes.

Q. Without the use of the word "current" and speaking of horse-power, don't you think that that affidavit would be misleading, don't you?

A. Without using the word "current"? [384—317]

Q. Yes. A. Yes, it is slightly misleading.

Q. This whole change in the system of the delivery of the power in this case has taken place since you came into the employ of the defendant companies?

A. What change do you refer to?

Q. That is the reduction so we can't get a starting load and the reduction of the setting of the circuit-breaker to 56 amperes.

A. I set the circuit-breaker at 56 amperes myself on or about December 6th, somewhere along there or the 4th; I don't remember.

Q. That is due to the construction you have placed on the word current, isn't it?

A. No, it is due to a construction that I have placed on a current of 300 horse-power.

Q. All right, a current of 300 horse-power; all right. You have assumed a construction of that and are following it out?

A. I have assumed the normal conditions, yes.

Q. If the contract—if a construction was placed on the contract to the effect that the real and legal intent of the parties was to secure and deliver 300 actual horse-power as distinguished from apparent

(Testimony of D. W. Proebstil.)

horse-power in electrical practice, then your setting of the circuit-breaker would be wrong, wouldn't it?

A. It would have to be changed according to the conditions agreed upon.

Q. Have to be changed, and the only practical way of changing it would be upon observations of a wattmeter, wouldn't it?

A. Not necessarily. [385—318]

Q. The most practical way then?

A. Not necessarily.

Q. Well, didn't you say a moment ago that the wattmeter was the most practical way of measuring power?

A. I did yes; but it wouldn't be necessary to put a wattmeter up there to determine that. You could do that—wouldn't be necessary to put a wattmeter on there at all to arrive at the safe and practical point of setting the circuit-breaker.

Q. Well, then, a wattmeter would really be of no use except for the information of the parties?

A. That is the idea exactly; as a matter of fact, the *practical would* be to install what is known as a power factor indicator; do away with the power factor wattmeter entirely, and install an instrument known as a power factor indicator. Such an instrument is made and *used* power companies.

Q. (By the COURT.) By what?

A. Power companies.

Q. (By Mr. SHACKLEFORD.) Well, your whole testimony in this case is based on the assumption—that you are acting upon the assumption that

(Testimony of D. W. Proebstil.)

it deals with a contract not to deliver 300 real horse-power but with a condition of 300 apparent horse-power, are you not?

A. A current of 300 horse-power.

Q. Well, you make a distinction between a current of 300 horse-power?

A. Why, any current whatever can be a current of 300 horse-power; two amperes can be a current of 300 horse-power; a thousand amperes can be a current of 300 horse-power; [386—319] conditions have to be agreed upon or stated.

Q. Then you could comply with this contract by delivering a current of one ampere and how many volts? A. Well, I would have to multiply it out.

Q. Well, just tell us. I want to get a little of this illustration.

The COURT.—I am afraid that is getting into illustrations again.

Mr. SHACKLEFORD.—All right.

A. (By the WITNESS.) It would be a matter of computation. Require quite a few volts.

Q. You could comply with that contract by furnishing the amount of amperage and voltage at your own will?

A. By installation of machinery to meet the conditions, but in all probability—

Q. Well, any current by multiplying volts by amperes, no matter how absurd would create an electrical current of 300 horse-power using that construction?

A. Yes, certainly, have a current of $1/16$ of an

(Testimony of D. W. Proebstil.)

ampere and still have a current of 300 horse-power, providing your other conditions were proper.

Q. Where have you ever seen—where have you ever seen a power factor indicator and ammeter used to regulate the delivery of a certain amount of power?

A. They are not used for that particular purpose.

Q. I understand, you just suggested that?

A. Suggested that.

Q. The common use where a horse-power is called for is to use a wattmeter, actual horse-power?

A. Why, in the actual service, if it is necessary to obtain power factor, the power factor indicator is installed; [387—320] then knowing the power factor that exists on the service it is very easy to get the determined point.

Q. Now let's go back and get that question again. I asked you if the common practice wasn't to use a wattmeter.

A. For indicating the power at any one instant, it is; or an intergrading wattmeter it is, yes.

Q. And for that matter to ascertain the power factor that you have?

A. No, you can't ascertain the power factor from a wattmeter, no.

Q. Can't you do it?

A. No; you have to have the other instrument accompanying it.

Q. But the wattmeter is the common practice in measuring horse-power, isn't it?

A. Measuring electrical horse-power, yes.

(Testimony of D. W. Proebstil.)

Q. Electrical power and—

A. A wattmeter, generally speaking, taking in the whole family of wattmeters, is commonly used for making measurements.

Q. Mr. Proebstil, do you know of any way of delivering an uninterrupted current of 300 horse-power. A. Do I know of any way?

Q. Yes.

A. That is a very, very general question; yes, I know of a great many ways.

Q. An uninterrupted current of 300 horse-power, no more nor no less?

A. Well, of course, external conditions would have to be just so.

Mr. J. HELLENTHAL.—Just a moment; the question would not include the terms of the contract. The terms of the contract “are not more than 300 horse-power,” not to exceed [388—321] 300 horse-power. The uninterrupted current is not to exceed 300 horse-power, but may be less.

Mr. SHACKLEFORD.—Very well, Mr. Hellen-thal, I think it is warranted from the contract, but I am going to assume it in this question that the contract calls for whenever there is sufficient water calls for 300 horse-power, no more and no less.

A. (By the WITNESS.) I don’t know as such conditions are stipulated in the contract.

Q. Well, it don’t make any difference. You can take my word for the question. I have a right to ask you that question with that assumption in it. Now, do you know of any way of making a delivery of an

(Testimony of D. W. Proebstil.)

uninterrupted current?

A. No, I do not, because it is impossible for the people at that power-house to regulate the consumption of the current from a point without.

Q. The only way that can be done would be by the installation of a separate generator, wouldn't it, separate water-wheel?

A. No, that wouldn't need it. It would be necessary to establish such apparatus on the outside of the power-house that would at all times consume exactly a certain amount of power, no greater and no less, and those conditions are entirely beyond the control of the station operator, the man at the station. He has absolutely no means of telling how many instruments or devices are going to be placed at a point on the circuit without. You can rate it up, but you can't determine the actual consumption.

Q. If a definite amount of water is furnished capable of producing a current of 300 horse-power? No more and no less. [389—322] Say a definite amount of water, a prime mover?

A. If it is capable of producing a certain amount, it is capable of producing a less.

Q. A prime mover sufficient to furnish a current of 300 horse-power in water under proper pressure, then, could be attached to a generator and operate a current of 300 horse-power without interference, and start machinery at approximately the same capacity?

A. It can operate such circuit. As to its ability in starting machinery would depend upon conditions.

Q. Well, would it start machinery of approxi-

(Testimony of D. W. Proebstil.)

mately the same power provided it is a separate generator?

A. Depending on how the machinery was started—different methods in starting machinery.

Q. Well, the ordinary inductive motor?

A. The inductive motor of 300 horse-power could be started by such a generator, I imagine, yes; but it would be a very severe drag on the motor for a little while.

Q. Yes, sir. A. On the generator.

Q. (By the COURT.) That is assuming the motor is unloaded.

A. Yes, start below 300 horse-power.

Q. (By Mr. SHACKLEFORD.) That is—well, the question is that it is loaded—that it is an ordinary load after it is started?

A. After up to speed, but couldn't start at 300 horse-power, and a continual demand from that time on for 300 horse-power.

Q. Oh, yes. What peculiar technical knowledge, Mr. Proebstil, [390—323] is necessary for the replacing of a circuit-breaker such as used on the connection between the line of the plaintiff and defendant companies in this case?

A. Doesn't require any technical knowledge whatever.

Q. Are you the one that has ordered it so we can't get that circuit-breaker back in until somebody crosses the channel from the island?

A. I haven't.

(Testimony of D. W. Proebstil.)

Q. You haven't had anything to do with that?

A. I have given no such orders.

Q. Do you know of any reason why that practice has been adopted?

A. That is a part that I have paid no attention to whatever.

Q. You know it is a fact?

A. I know it is a fact that we send a man over there to place the switch in. I know that fact exists.

Q. Do you know of any reason why it should be?

A. I have just answered that I do not.

Q. In case when you don't go over who goes?

A. I have a man who goes over there; one of my employees.

Q. Is there any reason why the man at the power-house can't reset the circuit-breaker that you know of?

A. As I said before, I am not familiar with the reasons why that exists.

Q. And from a practical standpoint you don't care what the intentions of your employer is?

A. As a matter of being able to throw it in, why anybody could throw it in. I believe you could throw it in.

Q. All right, thank you. I am through for the present. [391—324]

Redirect Examination.

Q. (By Mr. J. HELLENTHAL.) If the generator were installed with the exact capacity of 300 horse-power and a 300 horse-power motor was started on such a generator, could such an inductive motor

(Testimony of D. W. Proebstil.)

be kept running? A. Certainly.

Q. After it was started?

A. After it was started.

Q. Could it be started? A. It can be, yes.

Q. Without affecting the generator or burning it out? A. Well, yes.

The COURT.—I understand Mr. Proebstil's answer is that the motor would be unloaded, in ordinary practice that would be possible of course.

A. Certainly.

Q. (By Mr. J. HELLENTHAL.) Well, I mean a motor that is set to carry a load at 300 horse-power?

A. Well, you couldn't start that and have on a load, certainly not.

Q. (By the COURT.) Unless it was unloaded?

A. Unless it was unloaded.

Q. (By Mr. J. HELLENTHAL.) If the motor were unloaded?

A. If the motor were started idle of course.

Q. Oh, yes, that is different. Mr. Proebstil, I wish you would explain to the Court the meaning of this term "apparent power," and Mr. Shackleford has been talking about real power as distinguished from apparent power. What do you mean by apparent power in electrical phraseology? [392—325]

A. First, I want to state that there is one condition in which the real power and the apparent power are equivalent. That condition is such a condition that there is no inherent inductive characteristics in the system drawing a peak.

(Testimony of D. W. Proebstil.)

Q. (By the COURT.) Such as a synchronous motor?

A. Anything producing an inductive load.

Q. (By Mr. J. HELLENTHAL.) Now, just one question there, Mr. Proebstil. The word "apparent" in ordinary parlance means something as distinguished from real?

A. In ordinary use a term—

Q. Does it have that same meaning in electrical phraseology? A. It does.

Q. Now, go on and explain.

A. When the current is in phase with electro motive force, the actual condition of it which is the unit of power at unity, as taught in many of the schools, is equivalent to the product of electro motive force times the voltage times the phase factor distinguishing that from power factor. Now, that is at all times the apparent power. If you have two readings in a circuit, you can get the current reading and the other, giving the voltage reading. The product of those two varies with the other conditions that I have mentioned and gives you the apparent power. Now, in such case the circuit is inductive—in fact, the current leads, or, I should say, lags behind the inductive force of it; in fact in such cases there is capacity in the line and the current leads the electro motive force, the instantaneous variation of the current somewhat—is something less depending upon this angle of lead or lag. The other factor enters, which is called the power factor, then the actual power is equal to the product of the current times the [393—

(Testimony of D. W. Proebstil.)

326] voltage times the phase factor times the power factor, that is the true power. The first condition is the apparent power; the second condition is the true power. The relation between the true power and the apparent power gives you the numerical term power factor.

Q. The true power as used in an electrical term means developed power?

A. Yes, in the circuit, may be in heat or in—

Q. In some form? A. In some form.

Q. Apparent power means power that is not developed?

A. Apparent power means the power that is—that would actually exist if we had a unity power factor; in other words, if the current were in phase with electro motive force.

Q. Suppose you get that more clear, clearly, you understand?

A. Take the condition of direct circuit, direct current circuit, that is a condition in which the current is always in phase with the electro motive force and a case in which the power factor is always unity; therefore that factor—the power factor does not need to be considered in the computation of power; in other words, the power of direct current is always equal to the product of electro motive force times the voltage.

Q. And on an inductive motor this lag occurs by production of the power factor? A. Yes.

Q. Now, we will take the case at the Sheep Creek plant; is there anything in your apparatus at the

(Testimony of D. W. Proebstil.)

Sheep Creek plant that produces the lag in the current that is drawn by the plaintiff company? [394—327]

A. Nothing whatever. There is no inherent inductive characteristics. An oiled switch attached to the bus-bars.

Q. That is the only apparatus that is used there?

A. That is the only apparatus that is used in connection with the bus-bars, is simply an oiled switch.

Q. If a lag occurs or if the current is out of phase, why is it out of phase?

A. It is out of phase because of the character of the apparatus and measurement of the carrying circuit and which is beyond the power-house.

The COURT.—I will say to both attorneys that I rather think I understand this portion of it. If you think I understand it—

Mr. J. HELLENTHAL.—I know, Judge, it is difficult to understand—it is difficult for me to understand.

The COURT.—If you don't understand or you have a doubt about my understanding, you may continue. I am going to say to you that I think I do.

Mr. J. HELLENTHAL.—Well, then, we will go off on another subject.

Q. Now, there are no synchronous motors in use by the defendant companies at present?

A. No; no synchronous motors.

Q. Do you know of any synchronous motors that have been ordered by the defendant companies?

A. Two; yes, we have two synchronous motors or-

(Testimony of D. W. Proebstil.)

dered, large ones.

Q. Under orders and will be installed?

A. Just as soon as we can get them here.

Q. Any reason in the world that the plaintiff company can't [395—328] install a synchronous motor?

A. Not that I know of—plenty to be had.

Q. They are in common use in connection with operations of that character?

A. Well, decidedly. I am a young engineer and I think I have installed no less than about 15 synchronous motors of about 1,000 kilowatts capacity, 1,000 horse-power.

Q. If a synchronous motor were installed, I think it is understood that 56 amperes you furnished would approach unity?

A. By so adjusting the synchronous motor a unity power factor could be maintained in which the apparent power would equal the actual power.

Q. Now, how low a power factor have you seen, Mr. Proebstil, in your experience?

A. Well, that would be impossible to say. I have seen power factors to some motors for a short time as low as 20 per cent, possibly lower.

Q. In connection with inductive motors.

A. No, in connection with the generators.

Q. In connection with the generators as low as 20 per cent?

A. Due to external conditions of course.

Q. Now, Mr. Proebstil, you know of the gas plant that the plaintiff company has here?

(Testimony of D. W. Proebstil.)

A. I know they have a gas plant because I hear it working. I have never been in the gas plant.

Q. Is there any reason why the current of that gas plant cannot be synchronized with the current from the Perseverance? A. I don't see any reason.
[396—329]

Mr. SHACKLEFORD.—We object to that question as incompetent, irrelevant and immaterial. We have got no source of power except for the purpose of hearing the temporary injunction—if we have got another source of power it has got nothing to do with this case, in addition to that the synchronizing of that don't—simply testimony of some other source of power. I don't think it is involved in this case at the present time; am not sure.

The COURT.—Well, I ruled the other day, without probably having a very good knowledge of what was contained in the complaint, that there was probably an element of damages to be considered in the case, and if there is, why of course this would be just as relevant as the matter I ruled on the other day, so I guess we had better go on that theory because it is a question probably on the question if I find a certain way under the contract might not be equitable—I have some doubt that the defendants can't under the pleadings as they exist.

Q. (By Mr. J. HELLENTHAL.) How is that, Mr. Proebstil?

A. I don't know, or I am not familiar with the physical conditions that actually exist at that place over there, but it is my opinion that if the physical

(Testimony of D. W. Proebstil.)

conditions are what they should be, there is no reason why that power can't be synchronized with the line that is leading from our feeder. As I understand it, the frequency that they maintain at that place is 60 cycles per second and our frequency is 60 cycles per second. I understand they maintain a voltage of 2,300 volts; we maintain a voltage of 2,300 volts. If their phase rotations are in the same direction as our rotations and they install a synchronous motor properly adjusted so it will indicate. [397—330] The direction in which these two plants are in synchronism no reason why they couldn't be joined together and be operated in parallel.

Q. You have a unity power factor on the island in connection with the entire plant, have you not, in connection with the lights you use?

A. Well, probably, in some of the branch lines off the main line there are feeders, nothing but light, that is quite possible, small feeders, however.

Q. You have testified, I think, in answer to Mr. Shackleford's question that you based in your calculations in connection with the Alaska-Juneau, you based your calculations upon unity power factor?

A. I do, yes.

Mr. HELLENTHAL.—That is all.

Recross-examination.

Q. (By Mr. SHACKLEFORD.) What did you say the capacity of the synchronous motors that you had been—that had been ordered for Douglas Island?

A. I did not say.

Q. They are large motors?

(Testimony of D. W. Proebstil.)

A. Yes, sir, that is all I said.

Q. And what is their capacity?

A. I think one is 450 horse-power, I believe, and the other I do not know—I believe it is eight or nine hundred horse-power, very large motor.

Q. I understand in your installation of synchronous motors that you have installed a number of them? [398—331] A. I have, yes.

Q. As I understand it, they were of a type around about 1,000 kilowatt capacity?

A. Yes, a 1,000 kilowatt capacity.

Q. Were those installations made at mining plants?

A. No, they were made for power companies.

Q. If the synchronous motor is something that benefits the generating plant, and as I understand it it does—

A. It benefits the individual feeder on which it is installed, of course, that has—

Q. Has its corresponding effect?

A. Has, yes; in other words, it makes that feeder more efficient.

Q. And it adds to the generating capacity of the plant?

A. Well, why yes it does—keeps down line losses and it makes current available for other sources.

Q. Now, if the defendant companies desired and had permission to do so, they could place a machine at the—at a point where the motor of the plaintiff company is placed and thereby increase the efficiency—place a synchronous machine, and thereby

(Testimony of D. W. Proebstil.)

increase the efficiency of the plant?

The COURT.—That is to place a synchronous motor where the motor is at the Perseverance?

Mr. SHACKLEFORD.—Yes.

Q. They could do that?

A. That would be something that would be entirely beyond the element of good practice?

Q. Of good practice?

A. That is, for such a small feeding service as that, yes, it would provided that they would take—if we would install [399—332] a synchronous motor for no other purpose, assuming it were extremely necessary and would have to be another type of synchronous motor which is commonly called a series rotary condenser.

Q. It is another name for it?

A. Yes, and another design of machine, a series machine.

Q. It has been the practice in a number of cases, hasn't it, or in some cases, for the generating plant to go out to its consumer's contracts having been made on another assumption and after these synchronous motors have come into common use, go out and place these machines at their largest consumption points for the purpose of ascertaining their—

A. There is no such practice ever done as that. It is the consumers themselves for their own benefit who install synchronous motors.

Q. You don't know of that having been done?

A. That has never been done, so far as I know.

Q. You wouldn't attempt to say, Mr. Proebstil,

(Testimony of D. W. Proebstil.)

whether synchronism could take place between the gas plant and the defendants' current generated at the defendants' power plant without an investigation of the conditions at the gas plant?

A. I don't know anything regarding the physical conditions; I made that statement a little while ago.

Q. I see, you wouldn't undertake to say?

A. As the conditions exist at the present time I could not because if you have such an instrument the synchronism may not be the same, the physical relations may not be the same of the several things.

Q. Difference in prime mover?

A. But I do not say it is beyond possibility.
[400—333]

Q. No, but I say you wouldn't want to undertake to say it can be done without an investigation of the details?

A. Certainly, have to be investigated. Everything would have to be checked up properly.

Q. And some defects in the prime mover in the gas engine itself might have to do with the regulator?

A. That has to do with the physical conditions.

Q. Yes. So I will just ask you this question so that Mr. Hellenthal's may not be misleading; synchronism with a gas plant provided you left an inductive motor at that mine, at Perseverance Mine, wouldn't change the situation with reference to the power factors being involved, would it?

A. I don't understand your question.

Q. Well, I was afraid that Mr. Hellenthal's question might be misleading to the extent that it

(Testimony of D. W. Proebstil.)

would be understood if you synchronized that gas plant there, that synchronism would give you unity power factor under the conditions existing at the Perseverance Mine, that wouldn't happen, would it?

A. No, not necessarily.

Q. It couldn't happen so long as the load at the Perseverance Mine was still inductive, could it?

A. No.

Q. And the only way you could correct that situation at the Perseverance is either by synchronized motor or by one of the machines which you have just mentioned?

A. By a non-inductive load of some sort.

Q. Yes, of course, but what?

A. This other synchronous motor I spoke of is a series rotary condenser.

Q. Rotary condenser. But if a synchronous motor was installed [401—334] on the plaintiff's line and we were drawing 300 horse-power at all times—all the time no matter what change took place thereby in the amount of amperage given us, would not this motor really help your generator, not help us, because in each condition we are getting 300 horse-power while your generator would improve in capacity only?

A. Your question involves so many conditions it is pretty hard to answer. I wish you would read it again, perhaps probably divide it up in two or three questions; by that I understand it would have a varying power factor if you drew 300 horse-power continuously and your current was subject to change as

(Testimony of D. W. Proebstil.)

this question implies, why your power factor would be continually varying. I can't say that would help us. With that information I think it would be a detriment to us.

Q. A detriment?

A. If you were drawing 300 horse-power continually.

Q. I mean uninterruptedly.

A. Certainly, at all times a continuous draft of 300 horse-power, due to a synchronous motor or any other type of motor and your current was subject to change accordingly as your question implies, it would mean that every—for every change of current there would be a change of power factor, that would be detrimental to us.

Q. I guess I can get it now. The question involves the assumption, say, we are drawing 300 horse-power at all times, commence to draw it by means of an inductive motor and that we change to a synchronous motor? A. Yes.

Q. And still obtain exactly 300 actual horse-power?

A. In other words, your current would be closed if you adjusted [402—335] your load at unity power factor.

Q. Now, that result would help your generator and not give us any more power?

A. It would if you so adjusted your synchronous motor to operate at unity power factor. You must understand that a synchronous motor cannot be operated at a lagging or leading power factor.

Q. But suppose a synchronous motor is running in

(Testimony of D. W. Proebstil.)

such a way to get unity power factor, we are getting 300 horse-power, before our 300 horse-power has, the only result is to improve the condition of your generating plant?

A. To the 300 horse-power at our switch?

Q. Yes. A. It would help both of us.

Q. How would it help us?

A. Lessen your line losses, because less current flowing through it.

Q. We are talking about the condition existing in your bus-bar,

A. It would help you at the terminus of your line; it would give you more useful horse-power. The difference would be the losses of the line under the two conditions.

Q. How much would that be?

A. I don't know the conditions of the line. I don't know what the conditions on your line are under normal conditions, but I know with a drop in current your losses would naturally decrease.

Q. Well, the particular aid under those circumstances would be to your generator?

A. We would have the difference between the current.

Q. You would have the larger end of the improvement by a good deal? [403—336]

A. We would have a little increase in current available, yes.

Q. And whatever improvement would be comparatively.

A. That is, if we had water back of it, enough to

(Testimony of D. W. Proebstil.)

convert that current into useful work.

Q. If you didn't have enough prime mover, wouldn't make any more work?

A. But the same amount of water is converted in either case.

Q. So far as the water is concerned, it doesn't make any difference whether you are carrying an inductive load or a synchronous motor?

A. But your contract doesn't call for that.

Q. So far as the water is concerned no difference whatever?

A. So far as the water is concerned very little difference. I answered that question once.

Q. On an inductive motor at 70 per cent power factor, 300 horse-power doesn't call for any more water?

A. It uses a little more water, yes, owing to the fact that your losses in your generator are a little greater, owing to the fact that more current flowing, your generator has to meet that demand.

Q. That is comparatively small?

A. If you want to pin me down, I will have to qualify a little more, practically you know it indicates these results.

Q. Practically speaking, the amount of prime mover used to generate is the same under one condition as the other?

A. When you refer to prime mover, I presume you mean by that water. Yes, that is right.

Q. That is the prime mover at the Sheep Creek power-house? A. It is.

(Testimony of D. W. Proebstil.)

Mr. SHACKLEFORD.—That is all. [404—337]

Re-redirect Examination.

Q. (By Mr. J. HELLENTHAL.) What about the capacity of the generator, Mr. Proebstil,—how would that be affected?

A. Doesn't affect the capacity of the generator. It is constant, of course, but I don't understand your question possibly.

Q. If the generator is running at capacity—

A. If the generator is running at capacity?

Q. Is running at capacity, doesn't it make any difference to you—does it help the generator any whether 70 or 100 per cent except to burn it out at 70? A. No, couldn't burn it out.

Q. Well, if they drew a low enough power factor?

A. Well, of course, assuming such a condition being possible, why if they drew a low enough power factor and still maintain their 300 horse-power, why of course the current would be excessive, beyond the capacity of the generator.

Q. (By Mr. SHACKLEFORD.) That question contemplates an abnormal condition? A. It does; yes.

Q. There is a protective device on the generator to—

A. There is not on the generator, no. That is not common practice to put any protective device on the generator.

Q. You are protected by having a sufficient reserve?

A. We protect our generator through our feeder.

(Testimony of D. W. Proebstil.)

Q. Well, your whole system is protected by carrying a sufficient reserve at all times for any ordinary call? A. It is.

The COURT.—That is all; call another witness.

Witness excused. [405—338]

[Testimony of E. P. Kennedy, for Defendants.]

E. P. KENNEDY, being called and duly sworn, testified on behalf of the defendants as follows:

Direct Examination.

Q. (By Mr. J. HELLENTHAL.) Your name is E. P. Kennedy? A. E. P. Kennedy.

Q. Where do you reside? A. Treadwell.

Q. How, if at all, are you employed?

A. Assistant superintendent.

Q. Of the defendant corporations?

A. Of the defendant corporations.

Q. What is your profession and occupation—what is your profession?

A. Profession, as mining engineer. Present occupation is assistant superintendent of the defendant companies.

Q. How long have you been a mining engineer, Mr. Kennedy?

A. Well, I graduated in 1897 from the University of California, and the University of California doesn't issue degrees of mining engineer, but it is common practice when a man graduates from a mining course to call himself a mining engineer, so for some sixteen years, since 1897, I have been engaged in the work.

(Testimony of E. P. Kennedy.)

Q. During these sixteen years you have actually engaged in mining? A. Yes, sir.

Q. How long have you been assistant superintendent of the defendant companies?

Mr. SHACKLEFORD.—Why, Mr. Hellenthal, if you want to qualify Mr. Kennedy I will waive his qualifications.

Mr. J. HELLENTHAL.—You will waive his qualifications?

Mr. SHACKLEFORD.—I say as to his experience and as to his ability to testify. [406—339]

Q. (By Mr. J. HELLENTHAL.) Mr. Kennedy, you are familiar with the Sheep Creek power plant?

A. I am.

Q. You installed that plant, didn't you?

A. No, I purchased it. It was installed under the general direction of myself and Mr. Kinzie. I didn't actually install it.

Q. I mean you and Mr. Kinzie installed it. It was while you were assistant superintendent, that is what I mean? A. Yes.

Q. What kind of a plant is it, Mr. Kennedy—explain it professionally to the Court?

A. The plant consists of one generator of 1175 kilowatts at 100 per cent power factor.

Q. Well, how do you make the power, generate it?

A. We run motors with it and electric lights, and the motors, of course, start our machinery, run the mills and does the pumping and mechanical work around the plant, rock-crushers, etc.

Q. It is used in connection with your cyanide plant

(Testimony of E. P. Kennedy.)

and mills also? A. Yes.

Q. You know the plaintiff's property, I suppose?

A. I do.

Q. You are familiar with the location of the Perseverance mine? A. I am.

Q. The Sheep Creek mines? A. Yes.

Q. The Sheep Creek mines are a considerable distance from the Perseverance? [407—340]

A. Yes.

Q. You are familiar with the various forms of motors in use?

A. Yes, I am familiar with the various forms of motors in use.

Q. Now, Mr. Kennedy, you are familiar—

A. I will say I am familiar with some of the forms of motors in use; there may be lots of motors that I am not familiar with.

Q. The number of motors is so large you don't assume to know all about them? A. No.

Q. Are you familiar with the devices employed at Sheep Creek in connection with the delivery of the current of electricity to the plaintiff company?

A. Yes, I am familiar with the devices that we have installed for delivery current at Sheep Creek to the defendant company—that is your question, to the plaintiff company?

Q. Do you know how electrical current is measured? A. I do.

Q. Do you know how a current of 300 horse-power at the generating plant is measured?

Mr. SHACKLEFORD.—Just a moment. I think

(Testimony of E. P. Kennedy.)

that question has the intent by a circuitous route to reach the same result that the—upon which my objection was sustained last night. I will object to it as calling for a conclusion of the witness.

The COURT.—I think I will allow him to answer and find out on what assumption he is answering the question. [408—341]

A. (By the WITNESS.) The question?

Q. (Read by REPORTER.) Do you know how a current of 300 horse-power at the generating plant is measured? A. I do.

Q. (By Mr. J. HELLENTHAL.) How?

A. It is generated—it is measured by the reading of the amperage.

Q. Well, now—

A. The reading of the ammeter.

Q. Well, now, to get to this specific case at Sheep Creek, you know the method employed in measuring the current of 300 horse-power of the defendant companies to the plaintiff company? A. Yes.

Q. Explain that method to the Court.

A. The method at Sheep Creek of measuring this 300 horse-power is by the reading of an ammeter and setting a circuit-breaker to control the maximum output. The circuit-breaker will break when a point is reached beyond 300 horse-power and that is the point, or nearly that point, as the allowance of three or four horse-power, there is an allowance of three or four horse-power in the setting of the circuit-breaker; practically the circuit-breaker will allow 300 horse-power, ——— into the line of the plaintiff company

(Testimony of E. P. Kennedy.)

and when it reaches the point of 300 horse-power why it stops; goes out automatically.

Q. Now, how would you arrive in measuring a current of 300 horse-power—how would you arrive at what constitutes [409—342] 300 horse-power?

The COURT.—Let me see if I can't help the attorneys. I think I now understand, and I think it is clearly understood by each of the attorneys, that the amount of horse-power delivered by the defendant companies to the plaintiff company takes into consideration the power factor at the Perseverance.

Mr. J. HELLENTHAL.—Yes.

The COURT.—Now, there is not much use of spending much time on that so far as the facts are concerned.

Mr. J. HELLENTHAL.—The only question is, Judge, if it was understood that we delivered at the power plant a current equivalent to 300 horse-power at a unity power factor, there is no necessity of going into it. I don't know whether that is understood.

The COURT.—Well, I think there has been sufficient testimony from both the witnesses here. It is conceded that the present witness on the stand will show that 56 amperes is 300 horse-power, that is at unity—that is with 2300 volts.

Q. (By Mr. J. HELLENTHAL.) That is true, Mr. Kennedy? A. Yes, sir, that is true.

Q. And the circuit-breaker is set at 56 amperes with 2300 volts? A. Yes.

Q. Now, Mr. Kennedy, I wish you would go over this thing briefly and I think the Court understands

(Testimony of E. P. Kennedy.)

the matter clearly. It is really a matter of getting your testimony into the record—just explain in as short [410—343] a way as you can without leaving out things, just how horse-power, electric horse-power is measured, the method employed?

A. Well, the clearest way I can do is to speak—define what I mean by power, horse-power—power is the rate of doing work; when there is no work done, why, there is no power consumed; and I think that I can explain that—that is the general meaning of power; that when power is sold, say, the meaning of power, for instance, if you take *take* steam or a compressor here or various other circumstances, why we speak of steam as 32 pounds of water convertible into steam power or would be one horse-power. Now, you can take that steam and box it up and insulate the current in around it, you have got that horse-power; in same way you can take a tube, and the compressor here represents that, compress it, but a man can carry that tube around and never get any power, use of it, the same way you can voltage and amperage, and never get any power; there is no power until work is done, and it is an error for a person to speak of developing power in a wire, storing up energy. They don't sell power—you sell compressed air to a man or steam to a man—you don't sell him power, but you sell him stored up energy and he puts it at work; just the same way you speak of so much water in a dam, you speak of so many kilowatt hours stored up in the reservoir, never will be power unless you use it; and it is exactly the same way with

(Testimony of E. P. Kennedy.)

these conditions we are speaking about. We have so many amperes and so many volts. Now, as Mr. Wollenberg says, you [411—344] can't put a bunch of these kilowatts at the end of a line and say, "Take it" and have power. You can't deliver power because power is not power until it is turned into work. So the point is, if we have the elements of power, which is voltage and watts, and they are available, why, it depends on the use whether he ever gets any power or not, and it is absolutely beyond your control, so he has got to say whether he ever will get any power. I can't tell. I can I think with that analogy, and the only way to get at electrical terms is to make an analogy between something concrete and the way it is taught in the schools and universities, it is the only way you can get any conception of the thing, and when you get that conception in your mind it is very clear.

Q. What is sold in this case, electrical current—current or power?

A. What is sold, the electrical power—it is the stored up energy; power is not sold until the work is done.

Q. What are the elements giving us electrical current? A. Volts and amperes.

Q. Anything else go into them?

A. Nothing else goes into them.

Q. What constitutes the unit of power?

A. The watt is a unit of power.

Q. What is a watt.

A. A watt is a volt times amperage.

(Testimony of E. P. Kennedy.)

Q. Any other elements enter into a watt? [412—345] A. No other element.

Q. That is the unit of power in all cases?

A. In all cases.

Q. Now, Mr. Kennedy, just a question or two in reference to this power factor on the Perseverance line. As the power factor on the Perseverance line is either increased or diminished, that is to say, if the Perseverance people should put in—should put in machinery that would develop 90 per cent power, they would have a 90 per cent power factor? A. Yes.

Q. Ninety per cent elements of power I mean?

A. Yes.

Q. On the other hand, if they were to put in machinery that would develop 60 per cent elements of power furnished, they would have a 60 per cent power factor? A. Yes.

Q. Now, how would that affect the surplus of the elements of power remaining for use by defendant companies?

A. It would decrease the surplus remaining.

Q. That is to say decrease in the power?

A. In the remaining power. I think I can make it clearer by a possible analogy.

Q. All right, explain that. I will be very glad to have you.

A. If we had a pipe-line, for instance, of water under pressure and we were drawing water from the end of that pipe-line, the water that we drew out of the end of the pipe-line would be doing work, will be converted into power. Now, if you can conceive of

(Testimony of E. P. Kennedy.)

such a [413—346] scheme as alongside of this pipe-line making—putting in a tap and drawing water off and making that water circle from the pipe-line back into the pipe-line and around again so the pipe would not only have to carry the water that was impinged upon the wheel but the water that was delivered to the circulating system under a constant pressure, why, then we have a condition of this power factor; the water that is circulating in this system under a constant pressure would not only be doing that work but the water that went into the pipe-line and impinged on the wheel will be doing work and the capacity of that pipe-line for developing power is reduced by the amount that is by-passed from there around through it again; and I think that is as good a case as can be shown—some criticism to the analogy, but I think it would be admitted as about as near an analogy as you can get to this comparison of power factor. That is we are not using the power, we will admit; just as Mr. Wollenberg says, you have a wattless current or call it by any other name you please. We are not getting any power out of it ourselves but we are depriving others by it of just that much ability to get power.

Q. That is to say, with that reduction of power factor there on that account, do you know whether now that power out of these elements you speak of—they are not in evidence—they are not getting any more, they are only getting this 300 horse-power, but they are reducing the elements remaining for [414—347] you? A. Yes, that is exactly it.

(Testimony of E. P. Kennedy.)

Q. Now, when you say you are furnishing 300 horse-power and the Sheep Creek circuit-breaker is at 56 amperes, as a matter of fact being much—what you mean to say is that you are furnishing the elements of 300 horse-power? A. It is.

Q. Is there any apparatus installed at the Sheep Creek power plant, Mr. Kennedy, that would prevent a current of 300 horse-power, not to exceed 300 horse-power from flowing continuously?

A. There is not.

Q. The flow of current under the apparatus there would be continuous unless it exceeded 300 horse-power? A. It would.

Q. Is there any other known method—any other sensitive apparatus by which you can prohibit the drawing of a current in excess of 300 horse-power?

A. I do not know of any.

Q. There is no current that will—no apparatus that can be installed that will prevent the drawing of an excess of current, in excess—without going into it, I mean you to say you so understand?

A. Yes, the only apparatus we have is the one installed there.

Q. The circuit-breaker?

A. Yes, circuit-breaker.

(Whereupon the court took a recess until 2 P. M.)

[415—348]

Thereafter court reconvening at 2 P. M., the same day, all parties being present as heretofore, further proceedings were had as follows:

Mr. J. HELLENTHAL.—Your Honor, before Mr.

(Testimony of E. P. Kennedy.)

Shackleford proceeds with his cross-examination I wish to ask Mr. Kennedy a couple of questions I neglected to ask him.

The COURT.—All right.

Q. (By Mr. J. HELLENTHAL.) First, Mr. Kennedy, you heard the testimony regarding the fact that the circuit-breaker when it goes out is reset only by some electrician sent over from Treadwell?

A. I have.

Q. Now, is there any practical way by which the plaintiff company can prevent the going out of our circuit-breaker at all? A. There is.

Q. How is that?

A. Why, if they should install a circuit-breaker of their own between our circuit-breaker and on their line—between our circuit-breaker, and when they are consuming a peak, why, any circuit-breaker would go out and obviate the necessity of anybody going to the Sheep Creek plant.

Q. To put it back in?

A. Just put their own circuit-breaker in, throw it in.

Q. Now, Mr. Kennedy, another question with reference to this term “surge,” starting surge. What have you to say about that—what is a surge and what is meant by it?

A. I think the way the term surge is used it is exceedingly [416—349] confusing, and the way I would explain surge is by analogy, and it is the only clear way I know of to explain it. Now, when we are speaking of power, you mean—it means the rate

(Testimony of E. P. Kennedy.)

of doing work; therefore, if we have, for instance, say, a tram car on a track, or if we have a moving body on the floor, and we wanted to immediately get that tram car into a rate of speed of four or five miles an hour it would take an enormous amount of power to do it, depending entirely upon the time consumed; and so it is with this word starting surge they are using, it means that we have to overcome the inertia, the electrical inertia, of the machine in a very short space of time and that it means that we need to consume a great amount of horse-power—of power in order to do this. And this term “current” used as a surge is nothing more than a peak, and, furthermore, I believe the term is never used in that connection so far as I know and so far as the momentarily starting of one of these motors is concerned it means the momentary use of an excessive amount of horse-power, and the impression of this is that though this horse-power is only consumed for a fraction of a minute, for a small period of time, and if you go to figure that into kilowatt hours at so much per kilowatt hour you get a few fractions of a cent—it means this, that available horse-power necessary to start that motor may be drawn on at any instant, and if that horse-power, which is always in excess of the running load of that motor, if it is a 300 horse-power motor, it will vary from 50 to 200 per cent over [417—350] the running load—it means that you will have to actually take at any time you want to start one of these motors horse-power corresponding to 50 to 200 per

(Testimony of E. P. Kennedy.)

cent in excess of what it will take to run the motors, although they use the 500 horse-power but a small fraction of time it has to be available all the time because if we have to let them start their motors whenever they want to, why, it is just the same as saying there is 600 horse-power which we can't use because it has to be available for them. That is the way the term surge is used, as I understand it, in that connection.

Q. That is to say, you have to keep on hand a total horse-power available equivalent to the amount required to run the machine plus the starting current required to start it?

A. It means practically that; but when we speak of instantly—that is the general sense of it, and that is the truth of it in that it is a general answer.

Q. Now Mr. Kennedy, referring for a moment to synchronous motors—

A. A step further; this excess of horse-power which they call a surge will, on a registering meter or a meter capable of measuring power, actual power or whatever they want to call it, it will show on that as a record more than 300 horse-power.

Q. It will show on the wattmeter?

A. It will show.

Q. On the curve reading wattmeter? [418—351]

A. It will.

Q. Now, about this matter of the circuit-breaker at Sheep Creek. What do you know about the setting of the circuit-breaker at Sheep Creek?

A. That setting of the circuit-breaker at Sheep

(Testimony of E. P. Kennedy.)

Creek, it was—as far as my knowledge is concerned, that circuit-breaker at Sheep Creek was at all times set at 56, because in talking over the matter before the plaintiff company ever obtained the power that is the amperage that I considered and was settled upon as 300 horse-power, not by them but by ourselves, and at that time I left for San Francisco and was not here when the power was turned over, and don't know what it was set at, but it should have been set at 56 amperes right from the start and was from my knowledge of the circuit-breaker.

Q. You have never given anyone authority to set it at anything else? A. I have not.

Q. Now, Mr. Kennedy, with reference to synchronous motors, you have testified, I think, that the motors in use by you in the Treadwell Company's plants at the present time are inductive motors?

A. Yes, I have.

Q. They are not form K motors?

A. There are some form K motors and some form P and other forms of motors.

Q. Now, just one more question about the form K motor. How does the standing current required by the form K motors compare with the starting current [419—352] required by the form M or P?

A. Very much larger in the case of the form K motor.

Q. Very much larger?

A. Due to the fact that there is greater electrical inertia there, and this is the thing that is not to be overcome—electrical inertia. Forming an analogy,

(Testimony of E. P. Kennedy.)

if we take a body and want to get it suddenly into motion it takes greater horse-power, an enormous amount, depending upon the rate at which we put it in motion, and there is more electrical induction to overcome in form K motors on account of the *wheel* on there, more electrical inertia to overcome, and therefore takes more power to start it.

Q. Now, with reference to the Sheep Creek plant and the installation of your motors in the Treadwell Company's workings, will you please explain to the Court all about it, why you installed inductive motors and what was done about it and what your purpose was and all about it?

A. Well, I think we have done what ordinarily is done in all mining companies or power consuming companies, that is, we built a power plant and started to put in machinery to run that power plant. The particular plant wasn't put in for the machinery to run for that particular power, but is to take care of our future requirements. Now, if we get a plant on that load, we, as they call it, considered getting inductive motors on the entire circuit, we found out we were coming to the capacity of that plant, and then it is of importance now that we get the capacity out [420—353] of that plant. In changing we started putting in synchronous motors and we didn't start putting in synchronous motors until there was some object in view in putting them in, and that object in view is the capacity of the plant, and we are in exactly that state now, in order to increase the capacity of our plant we are now considering and

(Testimony of E. P. Kennedy.)

have negotiated to put in two synchronous motors as soon as they can be delivered to us.

Q. What is—

A. I may further state that when we first put in this plant we had practically no power, no electrical power, that is some two or three years ago when the Sheep Creek plant was put in. At that time, why, we figured on what kind of motors to put in and in speaking to one of the representatives of the General Electric Company he advised me or he suggested that—“Why don’t we put in a couple of synchronous motors to run our vanners,” which are small motors, only 50 horse-power motors, in the 240-mill; and it was no consideration to us then, we put in inductive motors; if no question about the capacity of a plant, why the natural thing to do was to put in inductive motors.

Q. They were some cheaper?

A. Well, they are—I can’t say about that phase, no, sir, because I don’t know.

Q. What is the size of the motors you have now ordered and are about to install?

A. The first motors coming will be a 300 horse-power and another—some doubt about it, will be 6 or 9 hundred.

Q. Those are the first two synchronous motors—
[421—354]

A. They are the first two synchronous motors that we will install and as our plant gets loaded up we will install more synchronous motors.

Q. The object of that is to get the full generating

(Testimony of E. P. Kennedy.)

capacity, that is to be able to take out what you put in?

A. That is the idea of it, to get the capacity of the plant.

Q. I think you have already stated, Mr. Kennedy, but in order to make sure of it, I will ask you if you were as an electrical engineer called upon to measure a current of electricity, not to exceed 300 horsepower at the generating plant, you would measure it in the manner you are at Sheep Creek?

Mr. SHACKLEFORD.—Wait a minute. We object to the question as calling for a construction of the contract and without having shown any qualification.

Mr. J. HELLENTHAL.—I think we misunderstood one another the other day upon that.

The COURT.—I think I will allow him to answer the question as to how he would measure it.

A. (By the WITNESS.) Measure it with an ammeter.

Q. (By Mr. J. HELLENTHAL.) In the manner it is now being measured? A. Yes.

Q. And you would consider the 56 amperes at a voltage of 2,300 as such a current?

A. I would; yes.

Mr. J. HELLENTHAL.—You may cross-examine.
[422—355]

Cross-examination.

Q. (By Mr. SHACKLEFORD.) Mr. Kennedy, supposing just from a practical standpoint a contract had been entered into for a certain amount of

(Testimony of E. P. Kennedy.)

horse-power—just exclude the word “current” from your mind at the present time—think of a mining camp where synchronous motors are not in use and where unity power factor didn’t exist, how would you measure the 300 horse-power if you had contracted to deliver 300 horse-power?

A. Well, I could not possibly measure 300 horse-power without having a conception in my own mind about what 300 horse-power means; we have been talking sort of loosely about horse-power, been talking about delivering horse-power, and if you will stick to a definition of horse-power it will be very easy to answer, but if we don’t it won’t. We never deliver horse-power. We deliver stored-up energy, and I can answer the question most easily that way. I will—answer the question if you will listen.

Q. I am just asking you for a single answer.

A. What I would do in that case?

Q. What you would do in that case where you had agreed to deliver me 300 horse-power?

A. Well, I could not conceive of myself in that position because I would not know what it meant.

Q. It don’t become power until it is turned on to the circuit and put in action? A. No.

Q. The fact of the business is it is impossible to deliver power? [423—356]

A. To deliver power.

Q. Impossible to deliver current until it is taken?

A. Yes, but we deliver stored-up energy, and we deliver that from which the party who purchase it can derive power.

(Testimony of E. P. Kennedy.)

Q. Having an adequate power plant and bus-bars and power plant in operation, you from the deliver power under the conditions upon which it is offered? A. Yes.

Q. That is all. It is impossible to deliver a current until it is taken?

A. Yes, but in the definition of horse-power they speak of various things as horse-power, as I said, they were speaking of a certain amount of steam and a certain amount of air under pressure as so much horse-power, but a person can turn over a package of this to you in a sealed tube and he won't be turning over that horse-power until he opens it and uses it. If he don't open it you have got that horse-power but he can't say how much power will be delivered to him because he don't know how much will be used, so he can't say. He will do this; he will deliver to you that from which you can get that power if you use it, but if you don't use it it can never be gotten.

Q. Well, you know, Mr. Kennedy, that it is the ordinary practice to discuss electrical energy in the form of horse-power, that is, people have never got away from discussing it in that form?

A. I know, but the point is, if you try to get it in the concrete form, can't have, as Mr. Wollenberg says, [424—357] you can't deliver it as a bunch of this or a bunch of that; that is the way people have it in their own mind. You can't do it. The only way of defining it, in my own mind, as all kinds of authority will define it, well, I take it as 746 watts,

(Testimony of E. P. Kennedy.)

and that is what I would deliver, and I am willing to deliver it to anybody that asks for that much horse-power.

Q. Well, now, take it from a practical standpoint, where you are discussing the subject in a community where power exists and you can offer to deliver a certain amount of horse-power it would be possible to make that mistake yourself, probably not in making a contract?

A. You see, we are discussing something practical when the question is not practical because it is most impractical. How are you to practically answer an impractical question—that is what it involves. I have no intention of not answering the question.

Q. Suppose before this case had come up you had—you have had occasion to order machinery, that is, a generator and motor which could be used in connection with it, that it happened that in informing the electrical company what you wanted, you might inform them in terms of horse-power, wouldn't you?

A. Probably would.

Q. Well, then in furnishing you with that machinery they would take into consideration the induction—the probable inductive loss—supposing you didn't order a synchronous motor, supposing you ordered a motor of ordinary character that is in use here now?

A. To make the question clear, would I be ordering the [425—358] motor or somebody else be ordering it.

(Testimony of E. P. Kennedy.)

Q. You would be ordering the two things together? A. How much power required to run it?

Q. I say, suppose you wrote them a letter and stated here is a circuit— A. Yes.

Q. We want a generator and we want a motor or several motors on the circuit— A. Yes.

Q. Inductive motors— A. Yes.

Q. And we want 300 horse-power— A. Yes.

Q. Now, what would you expect with reference to the relation of your generator to those motors, as to whether they were to deliver an apparent or an actual horse-power?

A. Well, the generator, answering that question, should be of such a capacity as would have to deliver power to us and would have to be an excessive capacity, that is the way generators are always bought, an excessive capacity so as to be able to run these motors.

Q. Well, it would be expected to be delivered—you would expect the order to be filled with the idea that you were ordering for actual power, wouldn't you, and that the inductive load would be considered?

A. I really don't understand the question even now. What you are asking me—

Q. Well, suppose you ordered machinery for the circuit? A. Yes. [426—359]

Q. A generator— A. Yes.

Q. And the motors— A. Yes.

Q. And the motors, we will say for the sake of the question, are inductive motors— A. Yes.

(Testimony of E. P. Kennedy.)

Q. Wouldn't it be likely or probable for you to write to them and tell them you were going to have so much horse-power?

A. So much horse-power to operate that generator which will operate motors?

Q. Yes. A. Yes.

Q. And that horse-power, in speaking of the horse-power in that sense, you would not speak of it in the apparent sense, you would speak of it in the actual sense of power, wouldn't you?

A. Well, now, when you say actual or apparent power it begins to get mixed again. I will use analogy again. I don't think any exception can be taken to analogies. What is apparent in the sense that you are using it is as I take it something that can be made actual; and if the sense of apparent is something that never can be made actual, it is just apparently there and not in reality there; but if apparent, the way you use it, means something that can be converted into actual, then I understand your question. Now, this apparent power that we are talking about is power that can be converted into actual horse-power. [427—360]

Q. Now, before you get to studying up this question, when you speak of a plant of a certain capacity of horse-power, and actual capacity, when at the same time having in view the use of that plant in connection with induction motors, you would mean that it would create, not in volts or amperage of that horse-power, but would create so much actual power to run those motors with, wouldn't you?

(Testimony of E. P. Kennedy.)

A. No, I would not. I will tell you, when I bought that plant at Sheep Creek it was all of it taken into consideration, the volts and the amperes and the ultimate capacity of that plant at Sheep Creek in volts and amperes, and we are now going into how to put on synchronous motors to use—was taken into consideration from the first.

Q. Your power consumption at the present time and in contemplation is increasing?

A. It is increasing, yes, and as we increase it we get to the capacity of the plant. The plant wasn't built with the idea of using it one year but was built for the future.

Q. Have you ever ordered machinery in the terms of horse-power?

A. When you say have I, I probably have; yes.

Q. Just horse-power?

A. Simply when would order a motor any time would say, Send me a 50 horse-power motor.

Q. What does that mean—have you ever ordered a generator in the terms of horse-power? [428—361]

A. Well, just the same thing; why, the electrical term is kilowatts or kilovolt-amperes.

Q. Well, I am—

A. When I order a generator I either have a conception of the generator as 1175 kilowatts at one hundred per cent power factor, which is the way all generators might as well be rated, and they are now so rated—sometimes I say 100 kilowatt generator at 100 per cent power factor, or a thousand K. V. A.

(Testimony of E. P. Kennedy.)

generator, and do not mention the power factor—it is a mere expression, this rating of the generator—is no mere expression of the size of the machine. If you tell a man you have a thousand kilowatt generator he doesn't know what you tell him, he doesn't know, he can't understand. He will have to know how you rate the circuit, what the commercial rating is, to get the size of the generator as compared to another size. You have to specify what you mean.

Q. So, when you run across the expression 300 horse-power, according to that form of definition, you can't tell what it means yourself?

A. You know yourself always when a man says 300 horse-power that the ultimate possibility of developing that power the same as we speak of so many horse-power in a waterfall or so much horse-power stored in a dam, he means what can be gotten out of that, not what you desire to get out of it, that does not make any difference; you speak of horse-power as what can be done. It is hardly within the limits of possibility because there [429—362] is always some loss, friction loss, and other line losses, but when one speaks of horse-power with any other terms to my mind you can't think of anything else but what you can get out of it.

Q. That is the personal opinion of yourself?

A. Well, it may be personal, but I think it is a fact, not only personal, but I don't think there is any question but what authority can be gotten on that point, when speaking of horse-power.

(Testimony of E. P. Kennedy.)

Q. May be possible. Have you ever been called upon to construe a contract like this before?

A. I think I can make the matter more—

Q. Yes, or no.

A. I can't say if I have been called upon to construe this contract or any other.

Q. Well, now—

A. I will take that back. I probably have construed contracts; no question about that.

Q. Well, now, what is the common method of measuring horse-power where the same is delivered?

A. The common method of measuring horse-power when the same is delivered?

Q. Yes, sir.

A. Well, now, we are just getting into another impractical question about horse-power.

Q. All right.

A. If you want to know the amount of work that is measured, the amount of energy that is consumed, why, I can answer the question.

Q. What is the measure, device for measuring horse-power [430—363] in case of power consumption?

A. The ordinary device would be to measure in electrical units, equivalent to horse-power, by kilowatts, would be the wattmeter which measures it in watts.

Q. Well, that is the ordinary device in use in the delivery of power, isn't it?

A. No, in the consumption of power.

Q. Is there any difference between the delivery

(Testimony of E. P. Kennedy.)

and consumption? A. There certainly is.

Q. You can't deliver except what is consumed, according to your own statement, Mr. Kennedy—you can offer but you can't deliver?

A. I know, but there comes the definition of power. I say I can take a sealed tube of compressed air and turn it over to a man and say there is 16 horse-power in there, and he can walk around with it, but there won't be any horse-power until he pulls out the stopper or the thing blows up. Now, when you deliver this it isn't horse-power until he uses it, and if he wants to know what he is using then we use a wattmeter and find the number of horse-power he is consuming, but that isn't necessarily the amount that we give him to consume that he gets. They sell compressed air, and they sell these other things, they call it horse-power, they deliver it to them, some of them get use out of it and some of them don't, it is perfectly possible for them never to get any horse-power out of these materials.

Q. What they get is stored-up energy? [431—364]

A. And if they don't use it they will never get their horse-power. But what we record is not what we give them but what they turn into useful horse-power.

Q. Yes. Mr. Kennedy, I understood you to say at the present time none of these mining plants around here, including the plant of the defendant companies, use anything but inductive motors?

A. I don't know as I said it; they don't, as a

(Testimony of E. P. Kennedy.)

matter of fact.

Q. So far as this system of synchronous motors is concerned, that was first suggested to you when?

A. About the time of the installation of the Sheep Creek plant. We were then considering putting in synchronous motors.

Q. That was—

A. Mr. Cashen, of the General Electric, representing them up here, was selling us machinery and was consulted before deciding what kind of motors to put in.

Q. That was after the execution of this contract?

A. Must have been after the execution of this contract, yes.

Q. And I will ask you this question: Do you know of any instance at which the plaintiff company has been requested by the defendant companies, unless you construe the testimony or statements at these hearings to be so, to put in a synchronous motor?

A. What is the question?

Q. Do you know of any instance at which the plaintiff has been requested to put in synchronous motors in [432—365] connection with these particular operations, by the defendants.

A. At any time? We have requested the Alaska—the Treadwell Company has requested the Gastineau Company to put in a synchronous motor.

Q. Yes.

A. I don't know, but I think there was a suggestion made to that effect. I don't know of any request made.

(Testimony of E. P. Kennedy.)

Q. Is that within your personal knowledge or something you have heard? Have you ever made any such request?

A. Not that I know of, I never suggested it.

Q. But there has been no formal request?

A. Not that I know of, no.

Q. And the common, ordinary types of motors in use in this mining district up to the present time has been the induction motor?

A. Yes, seeing that we are the users of those motors, practically all of them in the District.

Q. Now, you took charge of the plant at Sheep Creek and had a good deal to do with the construction of that plant?

A. Yes—why, not in the details, just generally; I purchased the plant and went over there to see how the work was getting along, and if you ask me about the details about it, won't be able to tell you.

Q. Well, just one or two matters I want to touch on; I think you are probably familiar with. When the defendants took possession of the property described in that contract that is sued on in this case you [433—366] found at the compressor plant there was one large compressor?

A. A large—of course, it is small compared with the compressors on the island.

Q. Well, just state the capacity of the compressor in terms of horse-power.

A. I would say about 175 or possibly 200 horse-power, depending entirely upon the pressure rating.

(Testimony of E. P. Kennedy.)

That is another thing that is always loosely spoken about, is horse-power. Impossible to know just what you can put on to a compressor machine, but whatever the machine will stand, but ordinarily I think it would be about 175 horse-power.

Q. What has become of that compressor?

A. That compressor is now up in Gold Creek.

Q. That is being run by a motor?

A. Well, I assume it is being run by a motor and may be by water. I don't know.

Q. Well, operated by a water-wheel?

A. There is a water-wheel on the same service.

Q. The motor is connected with the power line of the defendant companies? A. Yes.

Q. That is the compressor for which a larger motor has been ordered?

A. Well, that is, I think, so far as I know, it is, since I heard it—this morning was the first I knew about that, so I don't know much about that.

Q. But that is the compressor stationed at that point which Mr. Proebstil described about another motor [434—367] being ordered for it of 200 horse-power? A. Yes.

Q. Now, how much of a starting surge will that take when it is installed?

A. Well, I would say any of these motors will take from 50 to 200 per cent, momentarily, horse-power, though it doesn't matter whether they are loaded or not—I mean the point about loading; of course, the more they are loaded the more it will take, but an unloaded compressor will take from 50 to 200 per cent

(Testimony of E. P. Kennedy.)

in excess of the normal horse-power it takes to operate it.

Q. That is to say, if it takes 200 horse-power to operate it, momentarily it would take a current of 600 horse-power or something. A. 300.

Q. 300 to 600 horse-power to start it? A. Yes.

Q. (By the COURT.) Even unloaded?

A. Yes; because it is the electric induction that has to be overcome; it is not really an idle machine.

Q. If you know, if your answer comprehends it, if loaded entirely different? A. Yes.

Q. (By Mr. SHACKLEFORD.) If you take a large system, an electrical system such as you have installed here and such as you have on your main circuits, the starting of machinery of that size is not a serious matter from a practical standpoint is it?

A. Well, if that was started accidentally or that happened [435—368] at the same time our other motors were started, may start at any instant, that would be a very serious matter.

Q. Throw out a number of circuit breakers?

A. Yes.

Q. Set at the same instant?

A. It is so hard to answer without conveying the wrong idea. If that plant was fully loaded and that was suddenly set on in excess, our generator might burn out, that would be apt to happen with motors thrown in at once which you were not prepared for, depending on how much work was going on there, the condition may be very serious.

Q. Well, now, take that instance you stated: a 200

(Testimony of E. P. Kennedy.)

horse-power motor operating a compressor in the hands of the Alaska-Juneau Company, what precaution is taken when you start such a motor to protect your line?

A. Well, I don't know what precaution they take, but they don't need to take any, because we have a circuit-breaker there.

Q. Well, that circuit-breaker is set high enough for them to—to give them a reasonable starting load or surge, whatever you call it?

A. No, it isn't set any higher than 300 horse-power and can't start this surge for more than 300 horse-power, I think, and I don't see how it can be constructed any higher—it is set not to give them any more than 300 horse-power and this momentary start or surge, as you call it, it is just another way of saying horse-power, that is the word as you use it, that is what it means, it is set so they won't get any more than 300 [436—369] horse-power, they will not get 600 horse-power for even, although momentary use, of a delivery,—is a very serious matter, although a momentary load on the current, it is a very serious matter.

Q. (By the COURT.) Which company are you speaking of?

A. I am speaking of the Treadwell Company.

Q. With reference to the other companies?

A. With reference to the Gastineau Company.

Q. (By Mr. SHACKLEFORD.) Now, I am asking you, Mr. Kennedy, in the case of the Alaska-Juneau Company, your other customers, starting a

(Testimony of E. P. Kennedy.)

motor of 200 horse-power.

A. Well, he asked me—

Q. To go to an abundance of precaution, is it necessary for you, or do you do that to prevent disaster by reason of that starting surge?

A. The circuit-breaker, I presume—I don't know any of the details connected, but I would say the circuit-breaker was put in the line.

Q. But that circuit-breaker would go out if set at the capacity of that machine?

A. It certainly would.

Q. The normal capacity of that machine?

A. Certainly would.

Q. And they would not be able to start?

A. They would not be able to start.

Q. But the circuit-breaker is set at a point sufficiently high in that instance of the Alaska-Juneau?

A. Yes.

Q. To give them the necessary starting load?

A. To give them sufficient extra horse-power to start [437—370] that motor.

Q. Now, what particular inconvenience do you suffer when the Alaska-Juneau Company starts a load of that kind?

A. We suffer because momentarily we are giving them this excess of horse-power and inasmuch as we are giving them that we are suffering that much, and, as I say, that is a most difficult thing to say, just what it might be if the Alaska-Juneau—the same with the Alaska-Gastineau or any other, if the motors were all thrown in at once, be a very serious matter. If

(Testimony of E. P. Kennedy.)

anyone is thrown on it isn't such a serious matter. If it got to such a point—things could get to such a point very easily where we would require the Alaska-Juneau to telephone to us at Treadwell before starting a motor, because we would not furnish them 400 horse-power at any time they wanted it, because we would have to furnish that when it would not suit our convenience; things haven't gotten to that state, I may say, but it would be very easy to conceive when it would be a very serious matter.

Q. As a matter of fact, you haven't got to that yet?

A. No.

Q. Well, you are in a position to give them a starting surge at any time?

A. Give them a starting load at any time—600, 1,000, any quantity of horse-power that they called for that we thought—that we thought we could sacrifice or dispose of to them in that quantity. [438—371]

Q. Well, now, referring to that other instance, supposing you have a generator of—suppose you have a prime motive power, state whether with a generator of sufficient capacity to give reasonable service, about 300 horse-power, or an inductive motor having a capacity—are you then in a position to give an actual and uninterrupted current of 300 horse-power?

A. If you want to start the motor that generator would momentarily have to furnish 600 horse-power or so much in excess of it (that is, of the 300) to start.

Q. But it would not take any more prime mover, Mr. Kennedy, would it?

A. Why, certainly, unless the horse-power was

(Testimony of E. P. Kennedy.)

there, why, we could not furnish it to the other companies and we would have to have 600 horse-power. It doesn't make any difference.

Q. Then the water—

A. Well, it doesn't, if we had 600 horse-power in water we could furnish 600 horse-power. I mean it is an assumption that if we wanted to start a motor of 600 horse-power have to furnish 600 horse-power to start it. And this other thing, as to duration, that is of no importance where we furnish 600 horse-power is a method of figuring it in kilowatt hours, it doesn't matter so far as dollars and cents is concerned, but means a lot when you consider that you have to have 600 horse-power available—it means the value of 600 horse-power all the time.

Q. Now, suppose the water at Sheep Creek gets down to the point where you are only generating 600 horse-power at that point—300 horse-power at that place—would [439—372] it be capable—wouldn't it be capable of starting a load of machinery of 300 horse-power?

A. Well, I think it is axiomatic; you could not.

Q. You could not?

A. If it takes 600 horse-power to start a motor you can't start it with 300 horse-power, no way of getting around that.

Q. Yes, if it does?

A. Well, I believe in this; it will be admitted that the starting of the motor or bringing from a state of inertia into motion it will take a great deal of power, and I think it will be admitted that it takes from 50

(Testimony of E. P. Kennedy.)

to 200 per cent more power to start one of these motors, and if it does that, it takes 300 horse-power to run it, and takes five or six hundred to start it; you can't start with 300; the thing is axiomatic,—you can't make 600 out of 300.

Q. All right. Now, Mr. Kennedy, we will assume this state of facts, that it takes 900 horse-power to start a 300 horse-power inductive motor. I want to know whether you want the Court to understand you as saying that it is impossible to start that motor unless you have sufficient water in Sheep Creek and your plant to actually produce 900 horse-power?

A. I certainly do. I want the Court to understand it can't start 900 horse-power unless you have the 900 horse-power to start it with.

Q. And that would have to have a prime mover in such condition that it is producing continuously 900 horse-power?

A. No, I don't say anything about it—the question, [440—373] so far as I am concerned, is—I think a mistake arose about it this morning, it was unintentional, that is, on Proebstil's part, what he said about the starting of a motor; now, if it takes 600 horse-power to start a motor, why, I think anybody doesn't need to be told to know there has to be 600 horse-power to start it, and you have 600 horse-power in the water and in excess of the amount for friction and other purposes, you have to have that much horse-power in the water to be able to start it. You can't start 600 horse-power with 400 horse-power, or 300 horse-power, but you have to have it.

(Testimony of E. P. Kennedy.)

Q. So that when the water in the Sheep Creek plant—the water is so low in the Sheep Creek plant at the pipe-line of the Sheep Creek Company or the defendant companies at the Sheep Creek plant that that plant is normally producing only 300 horse-power, it would be impossible to start a load of more than 100 per cent.

A. I think it is very probably so, yes. I think that is just the fact.

Q. You can't start a 300 horse-power motor with 300 horse-power on a separate plant in water.

A. To make it clear—there is a point to be confused in it. If you take 300 horse-power it takes 600 horse-power to start it. I can't start that motor with a separate plant which is only capable of 300 horse-power.

Q. All right. Well, cut out what it takes—can you actually do it?

A. Yes, of course, I can't. [441—374]

Q. No matter what it is?

A. Of course, I can't.

Q. You can't start?

A. I can't start 600 with 300, that is what this is, and I can't do it.

Q. Can you start 300 with 300—that is the question?

A. If it takes 300 to start it I can start it with 300. If it takes 600 I would have to have 600 to start.

Q. Now, you tell the Judge practically as a practical man whether you can do that?

A. I am talking as a practical man. The idea is

(Testimony of E. P. Kennedy.)

to get in something theoretical. If it takes 600 horse-power to start a motor and it will record 600 horse-power on a recording wattmeter or any device that is made to record horse-power with, you can't start that motor with anything short of 600 horse-power. I mean the thing is axiomatic. I don't see as there is any other way to answer the question.

Q. We will leave this subject with how much it takes on an inductive motor—

A. I will make it clear. Under ordinary conditions there is no such possibility as to conceive, under ordinary conditions, to put in a generator which is capable or which may be capable of generating sufficient power to take care of it, in other words, because the limit of the generator—if you can develop momentarily sufficient horse-power you can start the machinery and if you can't you can't start it, but you have to have a 600 horse-power to start it, and you can call the motor anything you like, [442—375] you can call it a 200, 300, 400, 500 motor.

Q. Leave out now about the generator, Mr. Kennedy. You have only got 300 horse-power whether—

A. Yes.

Q. Can you start approximately a 300 horse-power load with that? A. I should say I could not.

Q. It is impossible.

A. I should say so—certainly is.

Q. And if the ordinary ampere surge in starting that motor— A. Now we will get power—

Mr. SHACKLEFORD.—Now, just a minute. Wait until I get through.

(Testimony of E. P. Kennedy.)

Q. If the ordinary ampere surge in starting that motor when you have a large amount of amperes at your disposal is three times the normal consumption—when the water comes down to a place where it is measured in terms of power it is only capable of producing a normal load of 300 horse-power, can you start a 300 horse-power motor, approximately?

A. I will have to understand it in order to answer that question—if you mean is a certain thing, which you don't mention, could not be answered by anybody—I mean the question, that question, as I understand it, is if you needed an extra amount of amperes can you start it with 300 horse-power—is that it?

Q. Yes, sir.

Q. (By the COURT.) Of water—so no misunderstanding?

Q. (By Mr. SHACKLEFORD.) Water capable of producing 300 [443—376] horse-power.

A. Well, it altogether depends on what horse-power is required to start that motor. If you will say that one of these motors requires from 50 to 200 per cent to start it than it does to run them, in other words, a 300 horse-power motor requires four, five or six hundred horse-power to run it, then I will answer you you cannot start that if you have 300 horse-power in your water. Don't care what stage of the water or what kind of a machine you have got, you can't do it.

Q. That is not the condition I am considering in the question.

A. You are asking me about a surge and that surge

(Testimony of E. P. Kennedy.)

you are asking me about translated is horse-power; that is my translation of it. The only translation I can give in my own mind is what you probably mean by that word "surge," and that word "surge" conveys to my mind the only way I can express it. What you are meaning is another way of beating around the bush and saying surge instead of horse-power. And I have been looking up authorities for that word "surge" and I cannot find any authority for its use as it is being used in this case, and the only way you can use that word "surge" means horse-power, and if you mean momentarily you have to have a surge, you mean you momentarily have to have more horse-power.

Q. Mr. Kennedy, when the water in Sheep Creek is capable of producing normally 300 horse-power—

A. Well, capable of producing—

Q. So far as— [444—377]

A. First let me be sure—you see, first, asking whether we can produce horse-power and then whether we get horse-power and then the definition of horse-power and then the whole thing being answered—now, if we said we can't deliver horse-power—if we will define horse-power as 746 watts and stick to that definition of it, I will answer the question on that theory, and I don't see how to answer it on any other. Have to stick to what a horse-power is, and if a horse-power is 746 watts, I can answer all these questions without doing a whole lot of talking on both sides, but I can't do it otherwise.

Q. Now, I understand, Mr. Kennedy, that you have

(Testimony of E. P. Kennedy.)

taken a course in engineering. Water itself, under certain pressure or head, is capable of an estimated measurement as to productive horse-power?

A. It is.

Q. Now, you take a stage of water down there at Sheep Creek and there are probably such stages occurring when that plant is producing only 300 horse-power, aren't there?

A. I presume there is, certainly can be stages, yes, no question about that, about admitting anything of that kind.

Q. Now, then, taking one of these conditions where your water in the creek is only producing 300 horse-power at your generating plant, can you not start a 300 horse-power motor on that plant line?

A. Not if that 300 horse-power motor takes more than 300 horse-power to start it, I can't.

Q. Never mind, Mr. Kennedy, considering what it takes, [445—378] as a practical man, wouldn't you undertake to start the motor?

A. As a practical man, you ask me to consider what it takes, as a practical man, what does it take to start it—can't be answered.

Q. Let me ask you this question: Don't you consider it a practical question to ask a man familiar with a certain plant if a plant of a certain character is capable of moving an inductive motor of a certain amount without referring to horse-power, knowing the particular capacity of it?

A. It is a pretty involved question and I would have to ask back and forth a lot of questions.

(Testimony of E. P. Kennedy.)

Q. You would not want to undertake to say to his Honor this minute in this case—

A. Not without explaining what I meant; no.

Q. As to whether, when the Sheep Creek power plant was in position of producing 300 horse-power, as to whether you could start an inductive motor of that capacity on that load alone?

A. I would say this—I would say that if an inductive motor—if it takes any less they can; if it takes any thing over 300 horse-power to start that inductive motor that I could not start it if I had but 300 horse-power at Sheep Creek. Well, isn't that the question?

Q. No, that is not the question. You have inserted into every answer an "if" as to my question.

A. Because I had to. I merely want it—you ask me to answer as a practical man and you put something entirely impractical to me. Now, if you ask me [446—379] a practical question, I will try to answer it as practically as I know how to answer it, but you say if a certain generator is put in there and if a certain inductive motor is there, do you only take something less, why, there would not be a load excess in it and the excess will not occur.

Q. When the water at Sheep Creek is running to a productive capacity of 300 horse-power and that alone if you put a load on the ordinary form K motor, can you start?

A. The maximum load I can start is 300 horse-power, and it will be less than that because a load loses between the water and there by leakage—that

(Testimony of E. P. Kennedy.)

is what I say, the maximum load I can start with 300 horse-power is 300 horse-power.

Q. Can you start—

A. I could not start it, I say, if it takes any more than 300 horse-power, I couldn't start it.

Q. It is impossible?

A. Why, certainly it is, I think it is axiomatic, you can not start 300 horse-power—600 horse-power with 300 horse-power.

Q. If it is a 300 horse-power, if that is what it is, you have stated in your direct examination it would require an overload for starting? A. I did.

Q. Now, if a normal load, say—we will get it down so as to get it within a reasonable range and avoid any smaller proportions—if the normal load on the motor is 250 horse-power, can you start it with [447—380] the Sheep Creek generating plant when the water is producing 300 horse-power?

A. I don't know. We would have to figure out just how much it takes to require—to start the 250 horse-power motor, but I will say this, if it takes more than 300 horse-power to start a 250 horse-power motor I can't start it.

Q. Now, in an actual case of that sort what would happen would be that your machinery would start, wouldn't it, but your amperage would rise and your voltage would decline temporarily?

A. What would happen in that case is, the motor would not start if not enough power to start it, it won't start.

Q. Well, I will admit if not enough power to start

(Testimony of E. P. Kennedy.)

it it won't start. Without any "ifs" and "ands" you know you can take a generating plant which has only sufficient water to generate 300 horse-power and start a 250 horse-power load on it, and what happens is that the amperage rises and the voltage falls temporarily; isn't that the case?

A. If it was possible for the voltage to drop and the amperage to rise it is possible that you could start it.

Q. Isn't that possible?

A. Yes, sir; I won't say that it is possible. I will go right back to what I have said here and said a dozen times, if that takes more than 300 horse-power to start you can't start it with 300 horse-power.

Q. Yes. [448—381]

A. That is the answer to every one of these questions.

Q. All right. Now, we will get ahead. That being the case, if the Sheep Creek plant at 300 horse-power can start an inductive motor of 250 horse-power, then the motor is not consuming 300 horse-power on the starting load? A. You said, if it can.

Q. Yes.

A. But I didn't admit that it could.

Q. All right. Admitting it can, we will follow your assumption out? A. Yes.

Q. Then there is something in the situation that proves that the starting load is not actually 300 horse-power, doesn't it?

A. It proves that it is more than 300 horse-power, doesn't it?

(Testimony of E. P. Kennedy.)

Q. If you are able to start, for instance, we will take you on your own statement now.

A. Yes.

Q. Supposing at the Sheep Creek power plant, Mr. Kennedy, you are only producing 300 horse-power and attempt to start a 250 horse-power motor on it?

A. Yes.

Q. If it starts then the power required to start that machinery is less than 300 horse-power?

A. Certainly is—if it takes 300 horse-power why it won't start anything less.

Q. Now, you insist that if the amperage rising on the starting load of three times the amperage of that [449—382] load, that load being 300 horse-power at normal, you insist that measure of amperage actually taken—that the horse-power is 900 on the starting load, don't you? A. I don't think I said that.

Q. Well, will you say that?

A. Yes, I will say that.

Q. That you can measure power expressly in amperes? Is that correct?

A. Amperes and voltage. I can measure power in watt current—the two—there are two elements I want—the instantaneous peak that comes on any kind of a circuit is voltage times amperes with the phase factor of the circuit regardless of whether it is alternating or direct.

Q. With the square root of 3 in the alternating phase?

A. In any formula the voltage times the amperage gives what the watt is, and if we will admit that fact

(Testimony of E. P. Kennedy.)

we can get all kinds of authority to show we have a definition of horse-power and get the whole thing over with.

Q. All right. Having a 200 horse-power motor at the Perseverance mine and it requires a surge or a starting current, to use your definition, of three times the number of amperes it takes to run it on its normal load? A. Yes.

Q. Now, you want to be understood as stating to the Court positively that that load cannot be started unless the Sheep Creek power plant is producing 600 horse-power? [450—383]

A. No, the points—and there are so many little points slipping in all the time it is difficult matter to get that thing plain—when that load is started if you are going to use 300 extra amperes, why, some of these extra amperes will be used as power, but others of those extra amperes will not, in other words, the power factor is coming in and we are getting another thing mixed up all through the start. One of these conditions is power factor, which is altogether different, as I tried to explain, not in starting, but the starting load of these motors is exactly the same, excepting possibly some forms of these motors are faster, to bring them into motion the more horse-power you have to expend, in other words, if you have an object standing still or an obstacle of any kind and bring it into a tremendous velocity in a very short space of time there is a tremendous horse-power; you can expend a tremendous horse-power and accomplish very little work; on the other

(Testimony of E. P. Kennedy.)

hand, you can do an enormous amount of work and expend very little horse-power, and that is the confusing point in this case, is the starting of the load and the power factor. They are two distinct points.

Mr. SHACKLEFORD.—That is all. [451—384]

Redirect Examination.

Q. (By Mr. J. HELLENTHAL.) Just a question or two, Mr. Kennedy. The Sheep Creek plant, the flow of water at Sheep Creek, for what part of the year have you sufficient water there to operate the entire plant?

A. O, giving a guess at it, without looking at the records, I will say six months.

Q. Six months. And the balance of the year you have—

A. Three months, say, half, and three months, say, a quarter or less.

Q. Now, just one more question with reference to the notice of the Alaska-Juneau Company in the starting of those motors, the Alaska-Juneau Gold Mining Company, while not interested in the Sheep Creek power plant, is operated and controlled by the same management that the defendant companies are controlled? A. It is.

Q. You are the assistant general superintendent of the Alaska-Juneau Gold Mining Company and Mr. Kinzie is the general superintendent of the Alaska-Juneau Gold Mining Company?

A. Yes, I am in reality. I don't know as I have got any special title. I am assistant to Mr. Kinzie and expect it goes with that. I am assistant to him

(Testimony of E. P. Kennedy.)

in all his capacities as manager.

Q. Well, the operations of the Alaska-Juneau Company are under your control? [452—385]

A. Yes.

Recross-examination.

Q. (By Mr. SHACKLEFORD.) And you have no difficulty with your starting loads with that company? A. Not that I know of; no.

Witness excused. [453—386]

[Testimony of R. A. Kinzie, for Defendants.]

R. A. KINZIE, being called and duly sworn, testified on behalf of the defendants as follows:

Direct Examination.

Q. (By Mr. J. HELLENTHAL.) Your name is R. A. Kinzie? A. R. A. Kinzie, yes.

Q. You are the General Superintendent of the defendant plants? A. I am.

Q. And also General Superintendent of the Alaska-Juneau Gold Mining Company? A. Yes.

Q. What is your profession, Mr. Kinzie?

A. I am a miner.

Q. You are a mining engineer?

A. I suppose so; yes.

Q. And also electrical engineer?

A. I graduated in electrical engineering; yes.

Q. Graduated as an electrical engineer?

Mr. SHACKLEFORD.—If you want to qualify Mr. Kinzie we waive the qualifications.

Mr. J. HELLENTHAL.—You admit Mr. Kinzie is qualified as an electrical engineer?

Mr. SHACKLEFORD.—We will not object.

(Testimony of R. A. Kinzie.)

A. (By the WITNESS.) I don't say that—I graduated with a degree but not with the degree of electrical engineer; they don't issue such a degree.

Q. (By the COURT.) What was your university, Mr. Kinzie? A. University of California.

Q. (By Mr. J. HELLENTHAL.) How long have you been General Superintendent of the defendant companies?

A. I think it was 1904 or '5. [454—387]

Q. Now, Mr. Kinzie, you are familiar with all the workings of the defendant companies? A. I am.

Q. At the present time. You know the properties of the Gastineau or Perseverance Company, whatever it is called? A. I do.

Q. You are familiar with the power plant of the defendant companies at Sheep Creek?

A. I am; yes.

Q. And you are familiar with the fact that the defendant companies are furnishing to the plaintiff company a certain amount of electric current—are furnishing the plaintiff company electric current under their contract? A. I am; yes.

Q. Now, Mr. Kinzie, before we go into that matter, you know the Sheep Creek mine? A. I do.

Q. You are familiar with those claims, that 30-stamp mill and the group of mines as operated by Hammond and Malony?

A. Yes, I was employed there at the time when operated by Hammond and Malony.

Q. Now, do you know, as a mining engineer, how much power, electrical power, would be required to

(Testimony of R. A. Kinzie.)

operate that plant, the 30-stamp mill as then on the plant, and the other machinery used in connection with it? A. I do.

Q. How much horse-power would be necessary?

A. We figured it at that time would amount to 200 horse-power. [455—388]

Q. Would that be enough to allow for starting peaks and everything else?

A. If the proper machinery was so installed, yes.

Q. And you can tell the Court, you say, as a mining engineer, that you could operate that mine with 200 horse-power? A. No question about it.

Q. By that you don't mean you can operate all the pumps and machinery they had, but the mine can be operated?

A. I mean by putting in proper machinery the mine could be operated as it then was with 200 horse-power.

Q. (By the COURT.) Was it actually operated by electrical power at that time?

A. The mill was run by electric power and at that time one compressor was run by water-power.

Q. By that time, is it 1909 that you allude to?

A. No, sir, the mines were idle at that time. The time they were operated—let's see, that must have been about 1902—I think somewhere in there; that was the last time they were operated.

Q. Never operated since then?

A. In 1909 no work had been done there for a long number of years and the mine was—the mill and everything was abandoned and in ruin, practically.

(Testimony of R. A. Kinzie.)

Q. (By Mr. J. HELLENTHAL.) Now, what machinery do you have at Treadwell, Mr. Kinzie?

A. I beg your pardon?

Q. What machinery do you operate at Treadwell in a general way? I don't care to be specific.

A. Why, we operate the necessary machinery to run the mine and the mills. [456—389]

Q. How many stamps?

A. At Treadwell we are dropping—

Q. When I say at Treadwell I mean the three companies, the defendant companies here, operating altogether as one known as the Treadwell Company?

A. How many stamps?

Q. Yes? A. We are dropping 900.

Q. There are some at the Alaska-Juneau?

A. The mill at the Alaska-Juneau is not operating at present.

Q. In connection with these you are also operating a cyanide plant? A. We are.

Q. Now, where do you get your power supply from for your operations?

A. Part of the power at the present time is steam power and part of it is electric power.

Q. Where does your electric power come from?

A. The electric power comes from three sources; one at Sheep Creek, one at Nugget Creek, and one from the steam turbine plant.

Q. Is your Sheep Creek and Nugget Creek—are your Sheep Creek and Nugget Creek plants at the present time able to supply the demands for electric current at your plant? A. They are not.

(Testimony of R. A. Kinzie.)

Q. In order to make up the deficiency you are operating your steam plant? [457—390]

A. We are operating our steam plants; yes.

Q. Now, coming to the matter of the contract was put in the answer, there is a contract—you know which one I refer to, the one that is referred to in the Gilbert contract?

A. The so-called Gilbert contract?

Q. Well, the one between the Oxford Company and the defendant companies referring to the Gilbert contract, are you acquainted with it?

A. I am, yes.

Q. Has that Gilbert contract ever been adjudicated or settled or determined upon as to what rights exist under that contract? A. Not fully, no, sir.

Q. Now, when did you first commence to deliver power to the plaintiff under the agreement that you formerly had with the Oxford Company?

A. To deliver power?

Q. Yes.

A. About two months ago. I don't remember the exact date.

Q. Now, what steps did you take, Mr. Kinzie, to furnish the plaintiff company with electric power from your Sheep Creek plant under that contract?

A. You mean the steps leading up to it, with regard to the transferring of rights?

Q. No. A. And so forth?

Q. No; I mean now with reference to giving the power available for them?

A. I see. Well, some time last June, I think it

(Testimony of R. A. Kinzie.)

was, we ordered switch-board, which didn't arrive, so we [458—391] took a switch-board belonging to one of our old generators—operated electric motors, and moved it to Sheep Creek and installed it at one end of our switch-board, and when we were satisfied that the rights of the Oxford Company had been transferred to the Alaska-Gastineau, why, we connected their wires, which had been brought to our power station, to the bus-bars over there.

Q. You were informed by the Oxford—by the Gastineau Company that they had succeeded to these rights? A. I was.

Q. And you then made the connection between their lines and your bus-bars? A. I did, yes.

Q. Now, in measuring—in making the power available how much power did you make available for the use of the plaintiff company at Sheep Creek?

A. Three hundred electric horse-power.

Q. How did you arrive at that, Mr. Kinzie?

A. Do you mean the method of figuring it?

Q. O, yes, the method of figuring the power in the current delivered?

A. Why, as the contract—as it is not stated in the contract and as the contract is indefinite, we took the power factor of 100 per cent and figured the horse-power in the usual method, by figuring the volts times the amperage times the square root of three divided by 746.

Q. That gives you 2300 volts and amperage 56?

A. 56. amperes.

Q. Then what apparatus did you install to limit

(Testimony of R. A. Kinzie.)

the amount of power taken? [459—392]

A. The method of limiting the amount of power—we put on an instantaneous circuit-breaker which, if the amount of 56 amperes were exceeded, the circuit-breaker would go out.

Q. The circuit-breaker is set a fraction above 56, is it not?

A. In reality it goes out about 60, close to 60.

Q. In reality goes out about 60?

A. Yes, it is set though at 56. No mechanical contrivance will be as quick as electricity, and consequently it will be one way or another, and to be safe we let it go the other way.

Q. Now, Mr. Kinzie, is there any other method by which you can limit the continuous flow of electricity except by the means of a circuit-breaker?

A. None that I know of. Well, you could fuse it.

Q. Fuse it? A. Yes.

Q. But that would be the same thing as a circuit-breaker.

A. Well, in fact your variation is a good deal greater in a fuse than in a circuit-breaker, very hard to get the fuses which are exactly the same, one might go out a little less and one a little more than 56.

Q. Well, the operation of the fuse would be the same as a circuit-breaker? A. Exactly the same.

Q. The effect would be the same?

A. Yes, the time limit might be a little longer, but very little longer, depending only on the kind of fuse. [460—393]

(Testimony of R. A. Kinzie.)

Q. Now, with reference to the various kinds of circuit-breakers, what kind of circuit-breakers have you in use?

A. We have two types of circuit-breaker; one type is the time-limited relay, which is used on our main circuits, that is connected at two plants, the plant at Sheep Creek and the plant at Nugget Creek, direct lines with the main switch-board at Treadwell; on all distribution circuits we use instantaneous circuit-breakers.

Q. How many distribution circuits have you?

A. We have leading out from our main plant—I think there are ten—well, some of those have nothing to do with the plants and other circuits but are actually controlled—

Q. Each by an instantaneous circuit-breaker?

A. Yes.

Q. Approximately, how many circuit-breakers have you in use?

A. Why, I should say 45 or 50, perhaps more.

Q. How many time relay circuit-breakers?

A. We have in use at the present time, I think we have three.

Q. One in connection with your main trunk line from Nugget Creek, one with your main trunk line from Sheep Creek, and one with your main trunk line from the steam turbine?

A. Some are transformers to our main buses.

Q. Now, what is the use and purposes for which a time relay circuit-breaker is designed? [461—394]

(Testimony of R. A. Kinzie.)

A. It is to protect the main line against trouble on one of those subsidiary lines, that is, if you have a motor—take a motor, for instance, running on a pump in a stamp-mill; now, if you had an instantaneous—if you have a time-limit relay on that motor to one of your branch lines, the chances are ten to one if you had trouble with that motor it would come through and shut down your entire system; the object of the instantaneous circuit-breaker is to as closely segregate the trouble and keep it where it belongs and not let it get into your main line and let it disturb the whole system.

Q. So that the object of installing the time relay circuit-breaker in connection with your main trunk lines—

A. That simply means it gives your main trunk line a chance to evade trouble that comes over one of the smaller instantaneous relays, you see, of a dead short—there is no circuit-breaker that will act instantaneously, consequently an instantaneous circuit-breaker so called is simply quicker than the time relay. Have a dead short coming through, it goes right through the entire plant and throws it—take, for instance, a short coming from Sheep Creek, from the Perseverance, while we are talking about that, that is right through our instantaneous circuit-breakers, gets through our line at Sheep Creek, gets through our relay circuit-breaker at Treadwell and shuts us down, shuts our entire plant down.

Q. When did that occur?

(Testimony of R. A. Kinzie.)

A. O, that was two or three weeks ago. [462—395]

Q. Two or three weeks ago? A. Yes.

Q. A short came in from the Perseverance, the plaintiff company and shut down your entire plant?

A. It did.

Q. Now, where the trouble or where the difficulty doesn't go to the extent of a short circuit the time-limited circuit-breaker gives the main line a chance to escape it? A. Yes.

Q. While the branch lines can go out?

A. That is it exactly.

Q. If such circuit-breakers were also installed in the branch lines what would the effect be?

A. Why, it would be constantly endangering your main system and shutting down perhaps either the whole or a large proportion of your entire system.

Q. If you installed a time relay circuit-breaker, for instance, in connection with the Perseverance branch line, distributing line to the Perseverance Company, what would be the effect on your plant?

A. Why, continue to burn our entire system, that is, if there were disturbances on it. It would pass right through and get into our main system and our main system would be disturbed in proportion to the disturbance on the branch line up to the plant. As soon as the relay goes out it acts as an instantaneous circuit-breaker.

Q. What effect might that have on your operations, Mr. Kinzie—first, upon your motors in general?

(Testimony of R. A. Kinzie.)

A. Well, of course, it depends on the intensity of the [463—396] trouble. Any trouble, no matter how slight, which has a tendency to vary the revolutions of our motors has a very bad effect, particularly on the concentrates. If you vary the speed of the vanners—your vanner is working up at a certain number of revolutions and if you increase or diminish the revolutions of that vanner you are losing one way or another, either part of your values are going over one end or part of your gangue goes over the other end. In the mill it is the same. If you slow down the number of your stamps will ——; if it increases the rate you are liable to shut them down, and a very good idea of that was the trouble at the Perseverance the other night. The circuit-breaker at Sheep Creek did not go out as they say. That wasn't the cause of the shutting down of their motor as they say it was. The trouble was a short circuit on our lines which caused a droppage in voltage, an instantaneous droppage in voltage. That very likely threw out their circuit-breaker at Sheep Creek, but I wasn't positive and I had report that morning, but I still did not want to be positive but I have been informed from Sheep Creek their switch was never out, and it simply shows the effect—

Mr. SHACKLEFORD.—We object to the testimony and move to strike it. If they want to go into that matter they ought to bring the witnesses that have such information.

Mr. J. HELLENTHAL.—We will bring in such

(Testimony of R. A. Kinzie.)

witnesses, otherwise that part of it may be stricken.

The COURT.—All right. The record may so show. [464—397]

Q. (By Mr. J. HELLENTHAL.) Now, then, the effect of the short circuit of the Perseverance the other day was the same as a short circuit, or so far as it would have to be furnished—

A. I think that a short circuit is nothing more nor less than an intensified load of the current at the time.

Q. Except it shuts our motors down and that requires where we have more complicated machinery, such as vanners and other matters, the effect would be more damaging? A. O, it shuts us down too.

Q. Now, what effect would a thing of that kind have upon your cyanide plant?

A. It would have the same effect, except to intensify the damage on account of the delicate operations going on.

Q. Well, now, explain that.

A. Well, in the first instance, for instance, if you are pumping solutions into a plant, gold-bearing solutions, for instance, into a precipitating plant, if the motors would stop, well, part of that solution would be possibly wasted at that time; lose the contents of the solution at that time.

Q. The gold contained in the solution at that time?

A. The solution at that time. The same way with the tube-mill, if you are cleaning the tube-mill and

(Testimony of R. A. Kinzie.)

stop your classifiers, anything that they embrace is wasted.

Q. You have a tube-mill?

A. We have; we have three of them. [465—398]

Q. That is in the stamp-mill?

A. In the cyanide plant.

Q. In the cyanide plant? A. Yes.

Q. Now, to what extent would that damage you in money—would the effect bring about a financial loss, that is what I am trying to get at.

A. It would bring about a great financial loss, but it is one that would take a considerable period of time to exactly know what it is, for instance, you don't know exactly the actual value in dollars at every step in your operation; we simply know it from day to day as to the tonnage handled through that operation, and in checking up at the end of the month those things are usually carried through into the refining-room; the extraction of the money is the ratio that you put in at one end and get out at the other, and you have to wait until such time as we can get an inventory, but we would know would be actual loss was.

Q. Mr. Kinzie, you know you have sustained a financial loss or cost of considerable size; it is quite important to figure in it dollars and cents what that loss was exactly?

A. I could not state definitely what it was—an unknown quantity; we don't know the value of the metals handled in the mill, the stamp-mill at the time—we don't know what the values of the metals

(Testimony of R. A. Kinzie.)

at that particular instant were in transit through our cyanide plant.

Q. What effect would the incoming peak or short circuit [466—399] have on the safety element, Mr. Kinzie?

A. That depends entirely on the intensity again of the short circuit and upon the way the machinery is running; for instance, the worst, the most dangerous point would be the underground work, particularly on the pumps in damp places, because it is a breaking down of the installation at the particular instant, and if a man happen to come in contact with that part of the machinery at the time, he would be killed or very badly burned.

Q. You have a large number of men employed there? A. Yes.

Q. Something less than 2,000? A. Yes.

Q. Now, Mr. Kinzie, will the instantaneous circuit-breaker maintained by you on your line in connection with the distribution of the current to the plaintiff company permit the uninterrupted flow of current not to exceed 300 horse-power at the generator plant?

Mr. SHACKLEFORD.—We object to it as calling for a conclusion of the witness.

Mr. J. HELLENTHAL.—The purpose of it is to show that—

The COURT.—To show it won't interrupt the flow of 300 horse-power?

Mr. J. HELLENTHAL.—Yes.

(Testimony of R. A. Kinzie.)

The COURT.—Objection overruled. Exception allowed.

A. (By the WITNESS.) It will, yes.

Q. (By Mr. J. HELLENTHAL.) There is nothing to do to interrupt the flow of the current?

A. There is not.

Q. There is nothing maintained by you at the Sheep Creek [467—400] plant that would interrupt the flow of the current? A. There is not.

Q. Is there any other device that you know of by which you can protect yourself against the drawing of to exceed 300 horse-power by the plaintiff company? A. No other practical device, no.

Q. No other practical device? A. No.

Q. Would a wattmeter of any character installed at that point permit the drawing of a current to exceed 300 horse-power? A. Permit it?

Q. Yes. A. Have nothing to do with it.

Q. Have nothing to do with it? A. No.

Q. Mr. Kinzie, just in a brief way—this has been gone over by quite a number of witnesses, so be just as brief about it as you can without leaving out anything—explain the method of measuring the electricity at that point and how you arrive at the result that you have arrived at—what is the way in which you calculate the three hundred horse-power?

A. The power factor of the current is assumed at 100 per cent power factor. Our voltage at the Sheep Creek plant is kept constant at 2300 volts and being—and as the horse-power is equivalent to the voltage times amperes times the fuse factor or the square root of 3 dividing by 746, it gives you the

(Testimony of R. A. Kinzie.)

horse-power, and by taking that equation or simply substituting for it 56 in other respects you can [468—401] figure our power of the current which is the unknown quantity and that would give you 56.

Q. Now, Mr. Kinzie, when you say unity power factor, you mean by that, as I understand it, current from which 300 horse-power can be developed?

A. I beg your pardon.

Q. When you say that your figure at unity—at three hundred horse-power at unity power factor—

A. Yes.

Q. You mean by that that the current is of sufficient amperage and voltage that three hundred horse-power can be developed from it? A. Yes.

Q. Depending upon the apparatus installed for its development?

A. Depending on its application; yes.

Q. Who installed the apparatus on which that—who depends in this particular case?

A. The plaintiff company in this case.

Q. Have you any control over the apparatus to be installed? A. Absolutely no way whatever.

Q. Is there any power factor or any fuse displacement in your—inherent in your machine at Sheep Creek that would affect the power factor?

A. There is not; no.

Q. The entire question of what the power factor then is or what power the 300 horse-power would actually develop in useful power factor is a matter that entirely depends on what the plaintiff company does with the current?

(Testimony of R. A. Kinzie.)

A. What use is made of the current; yes.
[469—402]

Q. If it seems that I am leading in these questions, I am just trying to get it into the record as quickly as possible.

Mr. SHACKLEFORD.—We have no objection.

The COURT.—I have no objection.

Q. (By Mr. J. HELLENTHAL.) If a synchronous motor or electric lights is upon it the power factor will be unity—in their 300 horse-power?

A. Yes.

Q. If, on the other hand, inductive motors are used they will get less? A. They will.

Q. And the—as to just how much they will get will depend on the particular motor used?

A. Will depend on the motors used as well as the construction of their line transformers; in fact, everything on their lines.

Q. Many things enter into it?

A. Yes, their lights, for instance. Detrimental parts of their inductive motors, that is the detrimental effects.

Q. They are using some of this current for lighting purposes?

A. I understand about 14 kilowatts.

Q. Now, is there any particular power factor that applies to any motor or has each motor got a power factor of its own, that is the motors cannot be known—

A. An individual motor has not only not a power factor, a fixed power factor, but the power factor at

(Testimony of R. A. Kinzie.)

no instant at every instant you might say changes on any inductive machinery.

Q. Have you determined what the power factor would be [470—403] at one instant that would give you any idea of what the power factor might be a few moments later?

A. It depends entirely upon the use to which the piece of apparatus is being put to at that time.

Q. Varies from instant to instant? A. It does.

Q. Now, I wish you would explain, Mr. Kinzie. Some testimony has been given in relation to the order that was made with reference to the restoration of the circuit-breaker when it goes out—there has been some testimony regarding—relative to the fact that your instructions to your employees have been to the effect that when the circuit-breaker goes out you are to be notified at Treadwell so as an electrician can be sent over and the circuit-breaker is not to be restored at Sheep Creek?

A. Those are my instructions at Sheep Creek; yes.

Q. Now, why have you given these instructions?

A. The reason is to prevent the plaintiff company from subsidizing our employees and obtaining more than they are entitled to under their contract.

Q. Is there any way, particular way in which the plaintiff company can prevent the going out of the circuit-breaker at all? A. They can.

Q. How?

A. By putting in a circuit-breaker set just ahead of us.

Q. Yes. Then their circuit-breaker would go out

(Testimony of R. A. Kinzie.)

and put it back in as often as and as quickly as they please? A. Just as they please. [471—404]

Q. Without notifying you at Treadwell or anywhere else?

A. Be none of our business. Have nothing to do with it.

Q. You know Mr. Wollenberg? A. I do.

Q. You have heard Mr. Wollenberg's testimony with relation to a conversation had between you and Mr. Wollenberg in Mr. Shackelford's office about a year ago? A. I did.

Q. Will you relate to the Court what that conversation was?

A. The conversation took place during the month of March, 1912, in the office of Shackelford and Bayless in Juneau. I have been, I believe, into Mr. Shackelford's office. They were connected with or adjacent to the office of Shackelford and Bayless and he approached me and asked me if we were willing to sell the peak loads from our Sheep Creek plant. I told him, no, that I could not do it and would not do it. I then went on to say, so far as I understand the contract at this present time, it would be impossible. "I understand," he said, "that I understand it is—you mean to install circuit-breakers"—

Mr. SHACKLEFORD.—Just a moment. I want to inquire the purpose of the question, in the first place, so long as Mr. Kinzie is going to testify on this subject I shall object to any testimony concerning it unless it is predicated upon Mr. Wollenberg ownership or authority from the owners at that time.

(Testimony of R. A. Kinzie.)

Mr. J. HELLENTHAL.—Well, Mr. Wollenberg has testified, [472—405] I think, to that effect.

Mr. SHACKLEFORD.—No, Mr. Wollenberg's testimony was to the contrary, that they expected to take the plant over some time in the future. Unless the evidence is just submitted haphazard why it certainly has no competency unless Mr. Wollenberg was in a position at that time to bind the owners of the plant.

The COURT.—Well, of course that would go whether an objection was made or not, that would be the effect of the testimony, certainly. It would be ineffective as to what Wollenberg said at that time to this witness unless he, Wollenberg, was connected with the plaintiff company.

Mr. J. HELLENTHAL.—But you remember, Judge, during Mr. Wollenberg's examination on the stand I inquired of him in regard to this matter?

The COURT.—I will have to refer to the record as long as it has been raised by both attorneys; that is to say, what position he then held with the company, the plaintiff company.

Mr. J. HELLENTHAL.—I call your Honor's special attention to that part of the testimony of Mr. Wollenberg where he visited Mr. Bradley. Mr. Bradley asked him what his authority was and who he represented.

The COURT.—That was later, of course. I will take the record so there will be no question.

Mr. SHACKLEFORD.—My claim with reference to the facts is that the testimony in this case shows

(Testimony of R. A. Kinzie.)

that some time in the month of June the plaintiff company acquired the rights involved in this case and Mr. Wollenberg's testimony will have—and it will show in the [473—406] examination—it will show that it refers to the conversation that he had at the time when he was connected with Mr. Thane who had an option on a property and expected that he might assume it.

The COURT.—I rather think that is my recollection, but I am going to take the record in order to save me.

Mr. J. HELLENTHAL.—Mr. Wollenberg, at that time was also connected with the Oxford Company, I believe, and the Oxford and the Perseverance Company have since been merged into the plaintiff company.

Mr. SHACKLEFORD.—No, there is no testimony that Mr. Wollenberg was connected with the Oxford Company.

Mr. J. HELLENTHAL.—Well, I may be wrong about that; he was connected with the optionees.

The COURT.—If the question becomes material in my decision of this case I shall refer to the record.

Mr. J. HELLENTHAL.—Will bring out the testimony at the present time.

Mr. SHACKLEFORD.—Very well.

Q. (By Mr. J. HELLENTHAL.) You may tell the Court, Mr. Kinzie, what occurred between you and Mr. Wollenberg at that time.

A. He then informed me that on reading the contract—no, before that he asked me if we were going

(Testimony of R. A. Kinzie.)

to install instantaneous circuit-breakers and I told him that we were. He said under that condition this contract would be no good to us, and again asked me if we would sell him peaks over and above the 300 horse-power and I told him, no, giving the reason [474—407] that I had no authority whatever to make any electrical contract over and above the amount as stated in the contract, our Sheep Creek contracts, and he said, "Well, I am going to San Francisco," and I said, "Well, if that is the case you can drop in and see Mr. Bradley," and he said, "That is just exactly what I intend to do," and so on—during the month of April I heard from Mr. Bradley, saying that—

Q. That would not be competent, to testify to what you heard from Mr. Bradley, that would be hearsay.

A. All right.

Q. Now, in the matter about this circuit-breaker, why most anyone could put the circuit-breaker in. Would it be a proper and practical thing to immediately put it in after it went out?

A. No, it would not.

Q. What is the reason for that?

A. Well, the best reason I can give is exactly what happened at Treadwell; their circuit-breaker went out on a short circuit and the relays on one of the motors went to go out, just was turned on and the motor was burned up. The motor would stop when the juice was off and the first current came on again the motor did not start when the connections were made and the motor burned.

(Testimony of R. A. Kinzie.)

Q. Proper method to pursue is to find out and ascertain what the trouble is?

A. To give the operators of the different motors a chance to get to their motors and see if they are in condition to start, and that depends entirely upon the class of work you are doing. If you have more [475—408] you are then doing, have to go to the motors, your other regulators. We don't accordingly on our main bus-bars—we don't either on the switch the moment it goes out on a short circuit, until we have given the various men about the plant a chance to see that their motors are safe before throwing the switch back in.

Q. Now, what would be the effect on your available supply of electrical current if the plaintiff company were permitted to draw from your bus-bars at Sheep Creek or from your lines at the generator plant a current of sufficient voltage and amperage to operate, say, at 300 horse-power form K motor—do you understand what I mean? A. No.

Q. What would the effect be on your available supply of electric energy available for you in use in connection with your other operations, with your operations at Treadwell, if the plaintiff company instead of being permitted to draw 56 amperes at a stated voltage were permitted to draw, say, 80 amperes, which would be 300 horse-power developed considering the power factor were 70 per cent, you understand, or approximately that—what would be the effect?

A. Simply diminish our supply of amperage to the

(Testimony of R. A. Kinzie.)

extent that have to keep that amount of current, that amount of generating capacity in reserve for their use. We would be deprived of that difference in the generating capacity of our generator. [476—409]

Q. And when taken away you would have very much less? A. We would have very much less.

Q. Now, in relation to a starting peak—you are familiar with the form K motor? A. I am, yes.

Q. You know the form M and form P motors and various other motors in use? A. Yes.

Q. Which form of motor requires the largest starting peak, largest starting load?

A. The form K motor requires the highest starting load, I say, starting peak.

Q. Is that form of motor used generally to drive compressor plants?

A. No, it is not used to drive compressor plants.

Q. That is an unusual use to put a form K motor to? A. Most unusual use, yes.

Q. I think the Court understands, if a form M or form P requires a less starting peak, it is due, Mr. Kinzie, to the fact that external resistance is inserted?

A. You insert external resistance at the time of starting the motor, which reduces it.

Q. And those forms of motors can be started with very much less than form K motor?

A. O, yes, I think so, from a third to a fourth.

Q. Now, in connection with the installation of your Sheep Creek plant and the various conditions you have, most of your motors at present are all inductive

(Testimony of R. A. Kinzie.)

motors, are they not?

A. They are all of the induction type, the inductive [477—410] type. We have a number of motors that are really inductive motors but working under slightly different principle than the loads which we have been talking about, but they are usually small motors, so are known as record motors or motors of that character—repulsant motors I mean.

Q. Now, just one other question: How many motors, electric motors, are in use in this District in connection with mining operation outside of your own plant?

A. Well, I simply know that from hearsay. I understand there is one motor in the Perseverance, and two motors at Sheep Creek.

Q. You know of no other motors?

A. I know of no other motors.

Q. Well, are other kinds of motors in use for mining operations in this locality? A. Certainly.

Q. Except the motors in use by yourself?

A. Yes.

Q. Now, these three motors that you speak of, they are not used by yourself; in connection with yourself you also include the Alaska-Juneau, which is under you? A. Yes.

Q. Those three motors are in use by the plaintiff company, are they not? A. They are.

Q. Now, in installing your induction motors, why did you install them, and how did you come to install them, and what are you now doing with them? Explain [478—411] that fully to the Court.

(Testimony of R. A. Kinzie.)

A. Well, the reason that the various types—we started off, to start with, first, as you perhaps know, with the Sheep Creek plant and at that time we had no large motors in use—we had very small direct current motors—yes, they were all direct current motors we had at that time, and after the starting of the Sheep Creek plant we had a surplus of power and at that time we also had a very inexperienced lot of men to operate the motors, and taking the two things into consideration, the surplus of power and inexperienced operators, the best motors to use under those circumstances are the simplest type of inductive motors, and the simplest type of inductive motor in common use is what we have been talking about, is the form K motor of the General Electric Company, or the C. C. L. motor of the Westinghouse Company, and of the Allis-Chambers known as squirrel cage winding *rotar*, each of which is known as squirrel cage winding, and their chief advantage is that they are operated under extremely hard operating conditions, that is, they will stand abuse; at the same time they have a number of characteristics that are very hard on the operating force, and the worst of these characteristics is their starting load, their starting current will vary, say, from 3 to 4 times the starting load or the equivalent. And as our plant grew, we started out with small motors—as our plant grew, it became imperative to us to stop these [479—412] constant blows or constant drawing on our mail source of supply—we started in using the form M—I think we used the form M and form MA motor for a period,

(Testimony of R. A. Kinzie.)

and then started to use what is known as the form P motor—the form P motor is very much the same as the form M motor except in the brushes; they can be thrown off and on at will; is used particularly in the water motors, and most of our later installations, that is to say during the last year, we have used—yes, during a year and a half, were all motors over 35 horsepower that I recall at the present time that we bought had been either of the form P or the form K.

Q. The form K?

A. No, the form K or L. M. Now, as our plant has grown and at the present time we are approaching the limit of our generating capacity, and we are also approaching the limit of the corresponding capacity of our various resources, and for that reason to increase the output of our system and to also make it more efficient, that is considering the system as a whole, we are installing synchronous motors at the points where they would be of the greatest benefit to us, and one of these synchronous motors that we are going to install is much larger in capacity than is required for the capacity of the inductive motor that it is to relieve; the remainder of that motor is simply to be used to increase the efficiency of our entire system, by boosting the power factor.

Q. The purpose of these synchronous motors that you are now installing is to get out of the current more [480—413] nearly what you put into it?

A. Out of our generator.

Q. At your generating plant, more nearly what you put into it?

(Testimony of R. A. Kinzie.)

A. Yes, or, in other words, to reduce our power factor.

Q. To reduce your power factor. Now, the synchronous motor—what is the size of the synchronous motors that you refer to?

A. One of those motors will be used on a compressor, will be about a 300 horse-power, the other motor, depending on the factor that I just spoke about, will vary from six to nine hundred horse-power. It has not been decided. However, we have taken up the question with Dale; at the present time the exact power has not been decided upon.

Q. Now, this synchronous motor, Mr. Kinzie, is that a motor in common or general use with electrical operation?

A. It is—the particular use that we will desire is driving compressors.

Q. Driving compressors?

A. Yes. I think there have been more motors of synchronous type, considering horse-power that have been put to driving compressors during the last year than all other types of motors combined.

Q. Than all other types of motors combined?

A. Yes.

Q. Including all types of inductive motors?

A. Yes.

Q. And how long has the synchronous motor been in use?

A. Well, a synchronous motor has now been known and in use [481—414] for a long time, have been various improvements in the synchronous motor, par-

(Testimony of R. A. Kinzie.)

ticularly in the attempts toward regulating of the motor itself. The principle of the synchronous motor is one of the earliest principles known in regard to inductive motors.

Q. How long have the synchronous motors in commerce—what have you to say as to the number of years that the synchronous motor has been in use?

A. O, yes, it was in use long before I was in college, and I don't know how long before that.

Q. Long before you were in college?

A. I could not say as to that.

Q. What I am trying to get at is long before this Oxford Sheep Creek contract was made—

A. Yes, considerably longer.

Q. At the time of making the contract the synchronous motor was in general use?

A. Not only a motor in general use but a motor whose characteristics were known at that time as their attention was called to the fact, was explained to them at the time, even before they bought their machinery, that they could get the entire 300 horsepower by the use of a synchronous motor, that was explained to Mr. Wollenberg.

Q. Now, how does the cost of the synchronous motor compare with the other,—is it much more expensive?

A. No, it is not; it depends entirely upon the type and kind of synchronous motor you buy. Some of them are more expensive, yes, and some of them—why, if you [482—415] have certain external sources, power sources to start them, pay about the same price.

(Testimony of R. A. Kinzie.)

Q. About the same price?

A. The price of the type of synchronous motor that is used in compressors is more expensive than the small type of inductive motors.

Q. Slightly more? A. Yes.

Q. Now, with reference to the gas plant of the plaintiff company, are you familiar with the fact that the plaintiff company has a gas plant here for the generation of electric power? A. I am, yes.

Q. If that gas plant was in ordinary good running order and had efficient machinery, is there any reason why the current from that plant should not synchronize with the current from Sheep Creek?

A. I can't—I can say in regard to that fact that I have seen the time when gas engines, and have not only seen the time, but I have known of a great many instances in which it has been done, and where they are doing it now in the town of Portland, as I mentioned the other evening, they are doing the very same thing in generating power and throwing it on to the main line of the Portland Company.

Q. For the purpose of taking care of peaks?

A. For taking care of their peak loads and the very same thing here; I believe one or more was used on a bridge, the time of starting the bridge would throw it in use—but this particular installation I have never seen, but I believe at the time of starting the bridge the motion it requires, the power to come [483—416] out, out of the generator and start that power and finish up on their own power, they haven't the power to get the bridge in motion, but after they

(Testimony of R. A. Kinzie.)

once get it started they have sufficient power to do it—simply come in and connect. It is a matter I consider we can come in with any of our plants, why, within 15 seconds can bring it from the time they stop the generating plant and turbine plant and steam up and warm up from the time we start on water and come in from then up to starting in parallel won't exceed 15 seconds time after time, we can do it easily in a minute, but there are a number of things in connection with it that have to be properly done, that is, the instruments have to be calculated, the lines have to be the same, that is, by that I mean the rotations of the lines, the phases have to be the same, and, so far as I know, I have simply been in this plant, I believe the characteristic of their current is exactly the same as the characteristic of our line, have the same voltage, same phase, same number of cycles.

Q. Now, about the maintaining of a voltage in connection with the practical operation of machinery, it is necessary to maintain a fixed voltage, is it not, Mr. Kinzie?

A. For the practical operation of a system, yes.

Q. And the voltage maintained by you, 2,300, is that usually maintained?

A. That is the voltage, that is, yes, in the machinery of the mines at the present time. I rather think [484—417] where there is any distance in the distribution of this inside of a mile or two miles it is a common pressure that is used.

Q. Now, with reference to the throwing in of a circuit-breaker that goes out by the physical acts, well,

(Testimony of R. A. Kinzie.)

the actual physical work of throwing in the circuit-breaker can, of course, be done by anyone being sufficiently powerful, it does not require an expert knowledge or any knowledge of electricity to know when and how the circuit-breaker should be thrown when it goes out?

A. Under certain conditions it would; under most conditions it would not.

Q. Well, it would require a man of expert knowledge to know when the conditions arose?

A. If the circuit-breaker ever after setting a certain time is thrown in and immediately kicked out again, then a man would have to know what the reasons were, for under no circumstances—and if tried to throw the switch back again unless he had the trouble located—and if not an experienced man could not locate the trouble.

Q. The delivery of electric current requires in a general way, without reference to this particular circuit-breaker, the delivery of the electric current requires the services of an electrical engineer or an electrical expert, as I understand the answer?

A. I wouldn't say that it requires the services of an electrical engineer. It requires the services of a practical electrician. [485—418]

Q. He must have a knowledge of electricity?

A. He must have it; it is imperative that he should have.

Q. That is all. You may cross-examine. This contract relating to the Sheep Creek 300 horse-power provides that the defendant companies shall acquire

(Testimony of R. A. Kinzie.)

from the Oxford Company certain rights at Sheep Creek, including a wharf at Sheep Creek. That wharf was originally delivered to you by the plaintiff company? A. It was.

Q. Have the plaintiff companies complied with their contract in relation to that wharf and in relation to maintaining your possession of it?

Mr. SHACKLEFORD.—Now, wait a minute. We object to testimony. In the first place, it calls for a legal conclusion of the witness. In the second place, it introduces into this controversy an element that is not either in the pleadings or is not pertinent to the issues of this case.

The COURT.—It is not pertinent unless raised in the issues—not unless it is in the pleadings. If you claim it is in the pleadings.

Mr. J. HELLENTHAL.—I now ask leave of the Court, in order to avoid any question of the sufficiency of the pleadings, to insert in the answer by interlineation a statement to the effect that the plaintiff—that neither the plaintiff corporation nor the Oxford Company have complied with the covenants and agreement on their part in relation to the contract or contracts set up in the answer, meaning thereby the [486—419] contracts between the Oxford Company and the defendant companies. If this statement of noncompliance with the terms of the contract applied as to each of the contracts as set up in the answer, the specific purpose of the testimony upon this question being to show a noncompliance with the contract on the part of the plaintiff company

(Testimony of R. A. Kinzie.)

in order to prevent a defense of a specific performance.

(Argument of counsel.)

Mr. J. HELLENTHAL.—Let me make my offer: I now offer the testimony of the witness Kinzie to prove that the defendant corporations did not comply with—that the plaintiff corporation—that neither the plaintiff corporation nor the Oxford Company complied with the terms of the contract set up in the answer or either or any of them on their part in relation to certain operations therein mentioned—the testimony being offered going to the effect of proving the matters and things above inherent and heretofore inherent in my application to amend the answer.

(Argument of counsel.)

Mr. SHACKLEFORD.—Now, if the Court please, I do not desire to take the Court's time, but I want to make this statement to your Honor and to the record. The pleadings in this case show a specific contract, describing specific property. They further show the acknowledgment of a specific deed and I want to inquire now from counsel if there is any difference in the description of the deed from the description contained in the contract. [487—420]

Mr. J. HELLENTHAL.—My offer of the proof stands.

Mr. SHACKLEFORD.—Very well, I will leave the record to show that I also desire to state that there is a clause, as counsel has said, in the latter end of the contract providing during the leasing period,

(Testimony of R. A. Kinzie.)

that is, before the execution of the agreement, when the title to the property stood in the Oxford Company's name, that the Treadwell Company might in its option procure title by using the Oxford Company's name, a condition which passed as soon as the Oxford Company's deed was made.

The COURT.—The offer to prove is rejected and exception allowed the defendant.

Mr. HELLENTHAL.—I think that will be all. You may cross-examine.

Cross-examination.

Q. (By Mr. SHACKLEFORD.) Mr. Kinzie, did I understand you to say in your direct examination that the form K motor was not the kind of a motor that is commonly used in connection with the compressor plants of the capacity of the plant of the Gastineau Company at this compressor in Silver Bow Basin?

A. That is exactly what I said; yes.

Q. The use in such connection is not proper and customary or known?

A. Might be known but it is not proper and it is not customary.

Q. What is the corresponding—what is the corresponding motor to form K of the Westinghouse, what is that type? [488—421] A. C. C. L.

Q. C. C. L. Now, I hand you a bulletin of the Westinghouse Electric Company of October, 1908, circular No. 118, and call your attention to page 43, type C. C. L. motor, 50 horse-power operating power or compressor, cylinder-chain drive, type C. C. L.

(Testimony of R. A. Kinzie.)

Motor—that is one—I say, assuming that—what have you to say with reference to your previous statement?

A. Nothing whatever.

Q. Very well.

A. That is a small 50 horse-power C. C. L. motor. This bulletin, if you are correct, is 1908. In 1908 the type of motor corresponding to the form P motor and form MA motor of the Westinghouse Company had not been developed.

Q. At that time? A. At that time.

Q. When were they first developed?

A. The first I knew of the form P motor that is in general use was about—well, they were in the shop at Schenectady, I understand, about four years ago—the first they put them on the Coast that I know of was about a year and a half ago, two years ago.

Q. A year and a half ago.

A. The corresponding type of the Westinghouse Company has just been brought out this year, if my information is correct.

Q. The Westinghouse motor corresponding to the type P of the General Electric wasn't brought out until this year? [488½—422]

A. No, it is a slight—it has an automatic adjustment by which the brushes in a form P motor, the brushes are taken off by hand and in the type of motor which the Westinghouse uses is done automatically.

Q. And so far as the use of the motor is concerned, neither one of the types mentioned have been used except during the last two and a half years, is that it?

A. The type that I spoke of?

(Testimony of R. A. Kinzie.)

Q. Yes. A. No, not that I know of anyway.

Q. Now, Mr. Kinzie, the Sheep Creek mines are operated from the power plant which is installed on this property which you built, your new power plant?

A. No.

Q. On the property? A. Yes, close by.

Q. Close by? A. Yes.

Q. Among other apparatus there was a large—there were two compressors, one larger than the other.

A. One duplex and the other straight line.

Q. Which was the larger of the two?

A. The duplex.

Q. Where is the duplex compressor now?

A. The duplex compressor, with the cylinders up in the shop—is in the tunnel of Gold Creek, tunnel of the Alaska-Juneau.

Q. And that is the compressor for which a 200 horse-power inductive motor has been ordered?

A. A 200 horse-power form MA motor has been ordered. [489—423]

Q. What is the starting surge on that form M motor approximately?

A. The form M motor, let's see, I should say it would be from a half, even as low as a quarter of a starting load of a form K motor.

Q. That is the starting?

A. That is a slow speed motor.

Q. That is the starting surge when the motor is not belted to the load?

A. That is the—that is the peak due to the starting

(Testimony of R. A. Kinzie.)

load of the motor.

Q. When the motor is belted to the load or otherwise?

A. Well, in that particular plant we start the load with the water-wheel, bring it up with the water-wheel and throw in the motor.

Q. Well, suppose it were some other place where you didn't have the water-wheel to start it, what would your starting surge be—suppose you were running to capacity, running the machine at 200 horse-power, what would the consumption be on the starting surge?

A. Well, I should say at the instant of starting it would be something over 400 horse-power, at least 400 horse-power.

Q. Now, the Sheep Creek property had on it, the Sheep Creek mines, a 30-stamp mill?

A. A 30-stamp mill; yes.

Q. What would be the power consumption if running that?

A. That would take about 2.1 horse-power per stamp for that mill.

Q. 2.1 horse-power per stamp? [490—424]

A. Are you speaking about the conditions at Sheep Creek at the time this contract was given?

Q. I am speaking of starting a mill of that capacity, assuming it was put in decent shape to run?

A. That is a new mill of that capacity—what horse-power?

Q. No, suppose that mill were fixed up as well as it could be for running?

(Testimony of R. A. Kinzie.)

A. That would take about 65 horse-power to run that mill.

Q. And what would be the starting surge on starting that mill?

A. That depends again on the type of motor used and the way you would start it, that would be, say, with one type of motor could start it at about 120.

Q. Now, the compressor as it was installed down there didn't have anything to do with the operation of the mill?

A. None at all; well, other than the kickers and things of that sort.

Q. What, approximately, would be the lighting load for that plant there of the Sheep Creek lines?

A. O, that might be—might use up 2 or 3 horse-power in lights.

Q. How many lights would that furnish?

A. O, that would furnish about 50 or 60 lights, depending on the candle-power and what capacity of lights.

Q. That would leave you with the compressor, the mill and the lights accounted for now—is there any other power used there? A. There wasn't.

Q. That would assume that the railway and trams and lifts would be run by some other—from some other source of power? [491—425]

A. The railway is run by steam locomotive as it is now and the tramway run by gravity.

Q. What about the mine, in your application of the power at the mine?

A. At that time the only connection there was to

(Testimony of R. A. Kinzie.)

the mine runs to what was known as the Silver Queen tunnel.

Q. Had not been between—

A. Well, I could not say whether there had been or not, but at that time you speak of I know there was not.

Q. You were on the property just before it was operated or at the time it was operated, the last time?

A. No, I was on the property after it had closed down.

Q. You were not on the property at the time it was in operation? A. Yes, I was.

Q. Well, then, you were at the property then at the time it was in its last operation before this contract was made? A. Yes, yes.

Q. Now, you have claimed, Mr. Kinzie, from time to time, have you not, that under ordinary conditions this contract was only worth 100 horse-power except for the momentary surge required for starting?

A. I claim that for different purposes—for some purposes it is worth considerably less.

Q. Yes?

A. For lighting purposes in the town of Juneau where your load practically would be 25 per cent, it simply depends on whether you mean the mechanical use of it [492—426] or the financial question.

Q. I am speaking generally of your claim of the value of that contract—you have claimed that that contract really meant only 100 horse-power with a starting surge of 300, haven't you?

A. Would be around there, yes.

(Testimony of R. A. Kinzie.)

Q. Do you know, approximately, what the starting surge on the form K motor at the Perseverance mine is? A. I have no way of knowing.

Q. Have you got an ammeter of that small capacity to read—does your ammeter of that small capacity, you can't read the amount of surge of it?

A. I could not read the surge. We have an ammeter on there and the Perseverance work it.

Q. What is that?

A. We have an ammeter reads to 100 amperes.

Q. Just 100 amperage? A. Yes.

Q. Have you seen that ammeter? A. I have.

Q. I wish you would tell the Court what that ammeter indicates on its face when it measures 56 amperes?

A. Let's see—we have got—it reads on that ammeter—it is either one in twenty or one in four—I have forgotten which it is now, I could look that up and find out.

Q. That is to say since installing—

A. No, it is two and a half to one,—I think that is the ratio; I am not quite sure it is.

Q. That is the ammeter reads two and one-half times, that is, you would divide—you would multiply the reading [493—427] on the ammeter by two and one-half to get 56 amperes?

A. That is my recollection.

Q. The small ammeter, that had been altered so as to give a different reading on a different ratio from which it was originally rated?

A. Practically our ammeter will read one way or

(Testimony of R. A. Kinzie.)

the other, depending on the coils that you use in connection with them, you can put an ammeter on 2300 volt line for instance, it wouldn't stay there.

Q. What kind of an ammeter is under order for the plaintiff company's panel at the Sheep Creek power plant?

A. I think that ammeter reads up to 100 amperes.

Q. Is it without any ratio readings?

A. That reads direct.

Q. Yes, when was that ordered?

A. You mean for the new machine that is coming?

Q. No, for plaintiff company's connection.

A. Of the plaintiff company's connection?

Q. In connection with the plaintiff company at the Sheep Creek power-house.

A. O, I thought you were talking about Gold Creek; that on their board is operated, that belongs to a motor—generator set for locomotives at Treadwell.

Q. That is the present board?

A. The present board, yes.

Q. You ordered another one. Now, when did you order that?

A. That board was ordered, if I remember correctly, ordered last fall—June or July. [494—428]

Q. And that board had 100 amperes?

A. I don't remember whether the—I don't remember what it was.

Q. You don't remember, cannot state?

A. No, I don't.

Q. Has that ammeter arrived?

(Testimony of R. A. Kinzie.)

A. The equipment is here, yes.

Q. And included in that equipment is a curve drawing wattmeter? A. There was.

Q. When did it arrive?

A. It arrived on the last Curacoa.

Q. Do you know anything about the reason for the delay in its arrival?

A. The reason given to me by the General Electric Company was the rush of business in their works. We have wired time after time for it because we wanted the panel that is over there and wanted to put in use at Treadwell.

Q. Now, what is the ordinary unit of measurement of horse-power? A. Of horse-power?

Q. Yes, sir.

A. The unit of measurement of horse-power is a horse-power.

Q. Very well. What is the ordinary unit of measurement for electric power?

A. For electric power?

Q. Yes. A. Would be a watt.

Q. What is the ordinary device used in measuring electric power? [495—429]

A. The ordinary device would be a wattmeter for measuring watts.

Q. That is the one in general use?

A. I beg your pardon?

Q. That is the one in common use?

A. One or another type of wattmeter, yes, sir.

Q. Now, Mr. Kinzie, speaking in terms of actual power and not apparent power, the plaintiff in this

(Testimony of R. A. Kinzie.)

case has not received 300 horse-power has it?

A. You mean are they actually using 300 horse-power?

Q. Are they actually drawing 300 horse-power?

A. I don't know; I am sure.

Q. I am not speaking of use at their end of the line, I am speaking of the amount drawn at your plant?

A. I have no way of knowing what they are drawing. I don't know what current is drawn.

Q. Never made any investigation in that respect?

A. I have read the meter a number of times which we kept in our panel record of it and no record—record of it at all; I don't know what they are doing.

Q. Now, you know that when an inductive motor, that cannot have a unity power factor, speaking in terms of actual power, real power?

A. I know when there is an inductive load on a circuit that the power factor cannot be unity.

Q. There is no load on any of your power plant circuits outside of what electric lights you may have, there is no motor line of unity power factor, is there?

A. No inductive motor; no. [496—430]

Q. You have no motors at the present time except inductive motors?

A. A type of inductive motors; yes.

Q. You have one inductive motor ordered?

A. I beg your pardon?

Q. You have two synchronous motors ordered?

A. We have two practically ordered, an order has been given but the conditions of the synchronous con-

(Testimony of R. A. Kinzie.)

denser is to be determined by more—

Q. Both of them—the amount of both of them is yet to be determined? A. No.

Q. Just one of them?

A. We have ordered one of them to drive a compressor; the other will be used to drive a compressor also; the other one will be ordered shortly, you might say the order has been given, it is simply conditional.

Q. Now, with the compressor, you are going to drive with that motor now installed? A. It is.

Q. I wish you would give into the record the dimensions of that compressor in such a way that they can be determined by the approximate power to be consumed can be determined.

A. Why, the shortest way to give that is simply to get its capacity. If I remember correctly, the capacity is 5,500 feet of free air, permitting 90 pounds pressure.

Q. What type of compressor is that?

A. That is a Corliss compound condensing engine and the air end is two station intercooler. [497—431]

Q. What make is that? A. It is a Nordberg.

Q. A Nordberg. That is the first compressor plant that you have ever ordered a synchronous motor for?

A. No, the other compressor plant will be the first one to be—

Q. Will be installed?

A. Will be the first one installed.

Q. I mean these two are the first orders you have given for synchronous motors in aid of compressors

(Testimony of R. A. Kinzie.)

or to run compressors? A. Yes, yes.

Q. Do you know what the power factor is on the Alaska-Juneau line? A. I do not.

Q. Do you charge for the starting surge or load on the Alaska-Juneau circuit?

A. The charges are made by the regular readings of the ammeters, the chances are that the starting—I suppose I will have to use the word surge as you interpret it.

Q. Why, if you can.

A. The chances are that the starting load on that motor are not read, are not included in our record. I never told them anything about it, simply told them to indicate the reading of the ammeter at certain times. It is very regular.

Q. Now, Mr. Kinzie, a good deal has been said about the necessary reserve of power to take care of the starting [498—432] loads. What is the approximate consumption in horse-power of the Alaska-Juneau circuit?

A. The Alaska-Juneau circuit is about 270—about 300 horse-power.

Q. About 300 horse-power? A. Yes.

Q. You are undertaking—the undertaking of the defendant companies is to furnish horse-power to the Alaska-Juneau Company rising out of an agreement that has, that the defendant companies have gone into since the plaintiff company elected to take its 300 horse-power, isn't it—isn't that a fact?

A. Yes, I think this contract—this contract was made just about a year ago. It think it is a contract

(Testimony of R. A. Kinzie.)

that included both water, electricity, and some electricity.

Q. Doesn't that contract provide for delivering power in terms of horse-power? A. It does.

Q. How much? A. What is the price paid?

Q. No. How much power is provided for in the contract? A. It is not provided.

Q. Simply provides it may be assumed—

A. They are to pay for the horse-power consumed at a fixed rate.

Q. What is the price?

A. The price is \$60 a horse-power a year.

Q. \$60 a horse-power a year.

A. Yes. [499—433]

Q. That is to say you compute the average daily consumption and then multiply by 365?

A. What is that?

Q. That is to say in determining the amount at the end of the year that they would owe you you would compute the average daily consumption and multiply it by 365?

A. That would be one way of arriving at it, yes.

Q. Now, we were speaking about this—the danger of these sudden surges or loadings in starting loads, are you people able to protect yourselves against that in the case of the Alaska-Juneau Company?

A. We are.

Q. That is done by setting your circuit breaker at a much higher point? A. Yes.

Q. Is there any difference due—with reference to the danger from dead shorts or shorts or anything or any sudden condition, is there any difference between

(Testimony of R. A. Kinzie.)

the steps which you have to take to protect yourselves from the danger in the plaintiff company's lines than the steps you have to take to protect yourselves from the other of your feeder lines?

A. Entirely different.

Q. Entirely different? A. Yes.

Q. What is the increased danger?

A. The increased danger is that over one we have control ourselves; over the other we have no control whatever.

Q. Well, assuming competency or reasonable competency on the part of the plaintiff company, what is the difference in risk? A. In risk? [500—434]

Q. Yes?

A. I would say it would be considerable. It is only human nature that people who are getting a thing, and particularly where they think they are getting it for nothing, will not be as careful of the apparatus or the operation as the person who has the direct responsibility of it and we are very particular about the starting. When a motor goes up over 100 horse-power we are particularly careful about starting it.

Q. Well, in what respect do you require the Alaska-Juneau to notify you when it is going to start its motors?

A. As a rule, if the current goes off for some reason. In most cases it isn't required; simply done. They call us up and let us know.

Q. Now, you spoke a minute ago about the necessity of notice in case of short circuit or the circuit-breaker going out, assuming a reasonable telephone

(Testimony of R. A. Kinzie.)

connection between the power-house there is no reason why that circuit-breaker should be delayed between one to three hours?

A. There is a very material reason in this particular case.

Q. Well, I want you to go ahead and explain that. I want you to go into details about it so I can understand it.

A. Well, I have already testified to the reason why we are doing it. In Mr. Wollenberg's testimony—he was asked by our operator to—he was told by our operator that he wasn't wanted at the plant. The reason that he was told that he wasn't wanted at the plant was because the [501—435] operator, Mr. Kingsbury, reported to me that—

Mr. SHACKLEFORD.—Just a moment. Now, Mr. Kinzie, I don't care what Mr. Kingsbury told you. If you know anything about Mr. Wollenberg's deportment, of your own knowledge, I want you to say it; if you don't, I want you to bring the man here who stated it.

A. It isn't what you want at all. This is merely a question of why these orders were issued.

Mr. SHACKLEFORD.—I think, if the Court please, what Mr. Kingsbury told him is not testimony and is not responsive to the question.

A. (By the WITNESS.) Don't make any difference to me how that was construed, Mr. Shackleford, at all.

Mr. J. HELLENTHAL.—The question is not whether the testimony of Mr. Kinzie is competent to prove the fact that Mr. Wollenberg has done so, but

(Testimony of R. A. Kinzie.)

the testimony of Mr. Kinzie is competent to show why he, Mr. Kinzie acted, thusly and so.

The COURT.—Yes, I think that is so.

Mr. SHACKLEFORD.—I will withdraw the question.

A. (By the WITNESS.) That was the question asked me and that is the way I answered it. I don't care to answer questions of that sort at all.

Q. Now, Mr. Kinzie, in addition to Mr. Kingsbury, how many men have you got there?

A. We have two assistants to Mr. Kingsbury.

Q. You have three men there?

A. We have three men at that plant. [502—436]

Q. And one of them is on watch all the time?

A. One of them is on watch all the time.

Q. And the reason that you won't have that circuit-breaker set in from your plant is because somebody told you that Mr. Wollenberg had accidentally put the circuit-breaker on?

A. Not at all; that request has been made at our plant a number of times.

Q. That is to get into the plant?

A. No, sir, to put that switch in—switch in and hold it in so as to enable—

Q. Were you there at the time?

A. What is that?

Q. Were you there at the time that these requests were made?

A. No, I was there just after one of the times that they were called up but in this particular instance this man came to Treadwell and reported to me, and before I would even believe it I went with Mr. Ken-

(Testimony of R. A. Kinzie.)

nedy and Mr. Proebstil to Sheep Creek and asked Mr. Kingsbury to report the exact words used, to Mr. Proebstil, Mr. Kennedy and myself.

Q. That was considerate?

A. I don't know whether that was considerate or not.

Q. If you are going to repeat those words as repeated—the position, if your Honor please, of having carried the witness to a point where I find his testimony is based on hearsay, I reserve the right to strike his testimony at that point. I don't think that is any way to try a lawsuit, by hearsay testimony, and I could [503—437] tell from the direct examination whether it was hearsay or not; therefore, I move to strike all that testimony.

The COURT.—To strike his testimony?

Mr. SHACKLEFORD.—The testimony of Mr. Kinzie concerning the statement made by him that efforts had been made to subsidize the operators at the Sheep Creek plant.

A. (By the WITNESS.) I did not so testify.

The COURT.—He said to prevent it.

A. That was so far as I said.

Mr. SHACKLEFORD.—I don't want to argue over it. I simply say that whether the direct statement was made that such an effort was made or whether the statement was made because I feared it, Mr. Kinzie's testimony in its present condition has no business in this record unless they attempt to prove it by competent witnesses.

The COURT.—Well, possibly Mr. Kingsbury should be called and asked the details of why he, the

(Testimony of R. A. Kinzie.)

witness, has acted as he has with reference to the circumstances.

Mr. SHACKLEFORD.—Yes.

The COURT.—And probably Mr. Kinzie has gone so far now, the reasons are based on somebody else's information, that information if within reach of the Court should, of course, be brought here in the court. It is a rather serious imputation to make on a man. In a general way, I would like to see it cleared up for the sake of one employee as well as those on the other side. [504—438]

Q. (By Mr. J. HELLENTHAL.) Now, Mr. Kinzie, you made the statement that by the use of a circuit-breaker set at 56 amperes you were able to deliver a continuous current of 300 horse-power; that is the statement as I understand you, isn't it?

A. A continuous circuit?

Q. An uninterrupted current?

A. I don't—that is that whole case.

Q. I say you stated in your direct examination that by setting the circuit-breaker at 56 amperes you were able to deliver an uninterrupted current of 300 horse-power?

A. O, taking it in the general sense we have been talking, yes. I don't care to get into a mixup of technical parley.

Q. You don't mean to say that you have any device there which will give you 300 horse-power continuously in case of any ordinary operating contrivance, do you?

A. Do you mean, Mr. Shackelford, that the current that we furnish to you cannot under any circum-

(Testimony of R. A. Kinzie.)

stances be 300 electric horse-power?

Q. No, I mean to say that the circumstances under which you are offering horse-power are such that under ordinary operating conditions it cannot insure an uninterrupted delivery of 300 horse-power?

A. Not under the operating conditions as they presently exist, no.

Q. Well, those are the same conditions that exist with reference to the operations of all electrical machinery [505—439] necessary in the surrounding mines?

A. The difference is very distinct between a unit of one motor and a unit of, say, 30, 40, 50 or 60 motors, it becomes very much more flexible.

Q. Yes? There is a great deal of difference 'tween a 200 horse-power motor at Snowslide Gulch which you expect to install immediately and a 200 horse-power motor at the Perseverance mine?

A. There is.

The COURT.—Well, let me ask the stage of this hearing. If we are going to run any length of time I am going to take an adjournment.

Mr. SHACKLEFORD.—Well, I don't think I can complete the cross-examination this evening. I think I can get done by taking the matter up from Mr. Kinzie's notes and abbreviating the cross-examination.

(Whereupon court took a recess until to-morrow.)
[506—440]

[Testimony of Elmer J. Kingsbury, for Defendants.]

ELMER J. KINGSBURY, being called and duly sworn, testified on behalf of the defendants as follows:

Direct Examination.

Q. (By Mr. J. HELLENTHAL.) State your name, please Mr. Kingsbury. A. Full name?

Q. Yes. A. Elmer J. Kingsbury.

Q. You reside at Sheep Creek? A. Yes, sir.

Q. Employed at the power-house of the defendant companies? A. I am.

Q. You know Mr. Wollenberg? A. I do.

Q. Did you see Mr. Wollenberg in the power-house about three weeks ago? A. Yes.

Q. Did you have any conversation with Mr. Wollenberg at that time relative to the circuit-breaker? Just answer it, yes or no. A. Yes.

Q. What was that conversation? Just state the conversation, Mr. Kingsbury.

A. In the exact words as near as I can.

Q. Just as near as you can remember?

A. Why the circuit was open at the time and Mr. Wollenberg came down there to get us to hold in the switch or hold in the circuit-breaker while they started up, or so they could [507—441] start their Perseverance mine or their line, whichever it was, and I told Mr. Wollenberg that he would have to have permission from the Treadwell Company before I could close the switch, and he says—well, he says, “I want to get the circuit started,” he says, “There will be nothing said about it.” Well, I says: “You understand my orders from Mr. Kinzie are not to close

(Testimony of Elmer J. Kingsbury.)

the switch under any condition or not to touch it," and he said: "All right, then, we will take the matter up with Mr. Kinzie."

Q. You reported that talk to Mr. Kinzie?

A. I reported that they asked to close the circuit-breaker, and I reported the matter to him.

Cross-examination.

Q. (By Mr. SHACKLEFORD.) Mr. Kingsbury, Mr. Kinzie made the statement on the stand yesterday that Mr. Wollenberg had, according to his statement, attempted to subsidize you to hold the circuit-breaker in. Did you ever use any such language to Mr. Kinzie? A. Subsidize?

Mr. J. HELLENTHAL.—Just a moment; I object your Honor. The statement of Mr. Kinzie was not to the effect that Mr. Wollenberg attempted to subsidize this gentleman.

The COURT.—Didn't refer to this gentleman—this witness.

Mr. SHACKLEFORD.—I think he referred to this man.

Q. Was that all that was said?

A. (By the WITNESS.) That was all that was said [508—442] on account of the refusal. I told him if I would do a trick of that kind I would be liable to be discharged, and he says: "Of course, there wouldn't have been anything said about it," but he says: "We will take the matter up with Mr. Kinzie."

Q. As a matter of fact, Mr. Kinzie had told you if we got started at the Perseverance he would hold

(Testimony of Elmer J. Kingsbury.)

you responsible?

A. Yes; he told me to leave the switch alone entirely there, which I did.

Q. And he also told you if we got started he knew it would be your fault? A. Yes.

Q. That is all.

Q. (By Mr. J. HELLENTHAL.) What was that—that last statement—read it.

Q. (By Mr. SHACKLEFORD.) I understand it, the statement about Mr. Kinzie holding you responsible, Mr. Kingsbury?

A. Mr. Kinzie told me that if anything happened at the plant it would be put to me, and he gave me instructions if I was asked to hold the switch in to report the matter to him and I did, and he also told me that he would hold me responsible or to that effect, that I was in charge of the plant. There was nothing said that he would hold me responsible for the circuit going in or anything of that kind. He told me to leave the circuit-breaker alone as I did, which is all there is to it.

Q. Mr. Kingsbury, Mr. Kinzie told you he knew the Perseverance couldn't start in the way that circuit-breaker was set? A. No.

Q. If we could started he would hold you responsible?

A. He didn't say anything about holding me responsible for the Perseverance getting started. [509—443] He didn't tell me he would hold me responsible for the Perseverance getting started. He told me to leave the circuit-breaker alone and if they asked

(Testimony of Elmer J. Kingsbury.)

for power to report the matter to him and they have—

Q. There have been several occasions when the Perseverance mine was shut down and Mr. Thane and Mr. Pullen have both asked you to hold the circuit-breaker in long enough to get it started, haven't they?

A. Yes; they have. They have asked me for the circuit and I have always advised them to the same effect that Mr. Kinzie said they had to have authority from the other side.

Q. I want to know if you told anybody that anybody tried to subsidize you or anybody else to hold this circuit-breaker in.

A. What do you mean by subsidized?

Q. I presume it has its common, every-day usage?

A. No, sir; never offered me money.

Q. Were you offered anything of value?

A. No, sir; nothing of value.

The COURT.—Mr. Kinzie, take the stand for further cross-examination.

Mr. SHACKLEFORD.—One other question, Mr. Kingsbury.

Mr. J. HELLENTHAL.—I want to ask Mr. Kingsbury another question.

Mr. SHACKLEFORD.—All right. Go ahead.

Redirect Examination.

Q. (By Mr. J. HELLENTHAL.) The other morning when the short circuit came in something like the 6th of this month was the Perseverance switch out?

A. No; the Perseverance switch hasn't been out.

(Testimony of Elmer J. Kingsbury.)

Q. Was it out yesterday?

A. No, it wasn't out yesterday. The circuit-breaker hasn't been out; hasn't been out since the last time that the man came to put it in.

Q. That was about the first of the year, wasn't it?

A. Yes.

Recross-examination.

Q. (By Mr. SHACKLEFORD.) The other morning after the short circuit, you were requested to hold the circuit-breaker in while the *Perseverance* was started, or somebody came over there to hold it in?

A. The last time, you mean?

Q. No; the time before the last; not yesterday, but two or three days ago when this short circuit occurred?

A. Yes; they notified me the circuit was open and I notified the other side and they sent a man over.

Q. And the circuit was held in and did go out?

A. No; it went out, first, and they put the circuit-breaker in and it held then.

Q. Then yesterday another start was made and it was held in while they started yesterday?

A. The circuit-breaker wasn't out yesterday.

Q. But it was held in afterwards?

A. Yes; it was held in.

Q. Now, that may have occurred from the circuit-breaker at the *Perseverance* going out and your circuit-breaker being set a little higher not going out?

A. That is possible.

Q. And nevertheless if the *Perseverance* had stopped, it would [511—445] need a new—if the

(Testimony of Elmer J. Kingsbury.)

Perseverance had stopped they would need a holding in to get a start?

Q. (By the COURT.) That is a holding in of the circuit-breaker at Sheep Creek?

A. Hold it the same as has been done every time.

Q. (By Mr. SHACKLEFORD.) If it stopped and no matter whether your circuit-breaker goes out or not, it would be necessary to hold it at the present setting?

A. Provided they get the excess use of current that it is set at.

Q. Well, an excess of current is necessary to turn that machinery over? A. To start it.

Q. Now, another question is this: Did Mr. Wollenberg have anything to do with telling you to set the circuit-breaker the first time? Did you set it on his orders the first time? A. No, sir.

Q. Whose orders did you set it on?

A. On Mr. Kinzie's orders.

Q. What was the amperage you set it on?

A. 56 amperes.

Q. The first time it was?

A. No, the first time the circuit-breaker was set—it was an impossibility to set it at that.

Mr. J. HELLENTHAL.—This is not cross-examination.

Mr. SHACKLEFORD.—I will call him for that purpose. I want to get it.

A. You want me to tell you when the panel was first put in?

A. Yes, on November 8th. How the circuit-breaker was set when the first current was passed?

(Testimony of Elmer J. Kingsbury.)

[512—446] A. It was set for 40 amperes.

Q. 40?

Q. Yes, on November 8th. How the circuit-breaker at that time when it was first put in.

Q. Well, did they operate on 40 amperes?

A. On the start they did.

Q. And until what time?

Q. (By the COURT.) That is you mean the Perseverance did?

A. No, the Perseverance didn't start at that time.

Q. (By Mr. SHACKLEFORD.) Well, the time the Perseverance was started, what was the circuit-breaker set at?

A. Why about, I should judge, the circuit-breaker wasn't calibrated, so I couldn't tell the exact amperage it was set, and so I should judge it was set at 56 amperes when the load would come at that point.

Q. Wasn't the circuit-breaker set at 100 per cent amperage when Mr. Proebstil took charge there?

A. No.

Q. It wasn't set at 100 per cent amperage?

A. The circuit-breaker—no, it wasn't set at 100 amperes.

Q. What was it set at when Mr. Proebstil came over there?

A. Well, it was—be set at the amount it goes out according to the load—56 amperes. My instructions was to adjust the circuit-breaker for 56 amperes, and I was adjusting it for that, but the circuit-breaker was not calibrated—the circuit-breaker was not calibrated to set at the readings that was on it.

Q. That is, it didn't work at 56 amperes?

(Testimony of Elmer J. Kingsbury.)

A. Yes; it worked at 56 amperes.

Q. Well, now, as a matter of fact, Mr. Kingsbury, you know it [513—447] was set much higher at the time Proebstil came over, don't you?

A. As a matter of fact, it was set or we were adjusting it to a point until we got that point. Yes; they had carried over 56 amperes.

Q. And they were carrying at the time Proebstil came over there, they were carrying 100 amperes?

A. No.

Q. How much were they carried—approximately?

A. Approximately 60 amperes.

Q. 60? A. Between 60 and 70.

Q. And Proebstil lowered the setting?

A. No; I adjusted the circuit-breaker down myself; I screwed it down.

Q. Under Proebstil's orders?

A. Under orders from Mr. Kinzie.

Q. I mean when Proebstil first went over there and took charge, didn't he go over there and attend to the resetting of the circuit-breaker about the 8th of November?

A. Yes; Mr. Proebstil was over there, but I screwed the circuit-breaker down.

Q. What do you mean by screwing the circuit-breaker down?

A. Set it—I adjusted it at what was supposed to be 56 amperes.

Q. From what?

A. No; the circuit-breaker wasn't calibrated; you couldn't read it; you had to adjust it by guess; had

(Testimony of Elmer J. Kingsbury.)

to adjust it so we would know when the circuit-breaker was 56 amperes.

Q. How did you know how to set it at the first time?

A. Set it way below to be perfectly safe and as the load came on [514—448] full, the ammeter will gradually work it up to the point that we knew it would carry the load.

Q. So, that it would carry the exact load that was being carried on the Perseverance?

A. No; not for that. To carry the circuit-breaker for the 56 amperes at phase.

Q. Well, don't you understand it that your circuit-breaker was set higher, considerably higher at one time than at the present time?

A. When it was first put in, but we were adjusting it until we could get it to that point.

Q. Why couldn't you tell by the ammeter readings?

A. Could; but the ammeter readings for the circuit-breaker was not calibrated for that load; much heavier load than they were entitled to.

Q. Much heavier load than entitled to at the circuit-breaker.

A. No; the circuit-breaker was not for that purpose. It was installed there to take the place—until the regular circuit-breaker came and this circuit-breaker is not calibrated for that load. This is the calibration for the reading off of the circuit-breaker, and it had to be set by guess and now due to the fact

(Testimony of Elmer J. Kingsbury.)

to give them the advantage so not going to blow out on their load.

Q. And gradually you were bringing it down?

A. Bringing it down until we knew we had it at 56 amperes.

Q. And this is the same circuit-breaker you have in there now? A. Yes.

Q. Now, Mr. Kinzie made the statement on the stand the other night that you set the circuit-breaker at the beginning of this time under instructions from Mr. Wollenberg? [515—449]

Q. I want to clear that up.

Mr. J. HELLENTHAL.—Never said any such thing.

Mr. SHACKLEFORD.—I have it in the testimony.

A. (By the WITNESS.) Mr. Wollenberg never had anything to say about setting the circuit-breaker to me.

Q. I just want to clear that up. Mr. Kinzie said the other night in his cross-examination in answer to this question: "What did you set it at when you first went to comply with this contract?" Answer: "They were instructed to set it at sixty amperes but it was—there was a man—by the man in charge. We thought that he knew how to figure it but he did not. He got it with the assistance of Mr. Wollenberg and we found it was set at a higher rating than they were entitled to, for the reason he had not multiplied by the square root of three; he had treated it as—." Did Mr. Wollenberg have anything to

(Testimony of Elmer J. Kingsbury.)

do with the setting of that circuit-breaker?

Mr. J. HELLENTHAL.—Just a moment. I don't care about asking this witness *whether had* anything to do with it. I don't want this statement about Mr. ——. I want to insist if any such statement as that it is a misprint.

Mr. SHACKLEFORD.—I am reading from the Stenographer's notes and my recollection of it. I want to know if Mr. Wollenberg had anything to do with it?

A. You mean that he told me how to set it?

Q. How to set it? Did he assist you in setting it?

A. No, sir; he didn't assist me in setting it.

Redirect Examination.

Q. (By Mr. J. HELLENTHAL.) Just a question or so, Mr. Kingsbury. You are familiar with the gas plant of the plaintiff [516—450] company?

A. Yes, sir.

Q. Do you know what is the reason they can't synchronize that with the Sheep Creek current?

A. They can synchronize it. I don't know why they can't.

Q. Well, why don't they synchronize it, do you know? A. I don't know why they don't.

Q. Any reason why it should not be synchronized?

A. Not to my knowledge.

Q. You can go over there and do it?

A. I could.

Mr. J. HELLENTHAL.—That is all.

Mr. SHACKLEFORD.—That is all.

Witness excused. [517—451]

**[Testimony of R. A. Kinzie, for Defendants
(Recalled).]**

R. A. KINZIE, heretofore duly sworn, being recalled for further cross-examination, testified further as a witness for the defendants.

Cross-examination.

Q. (By Mr. SHACKLEFORD.) Mr. Kinzie, there is only one or two questions I want to ask you. The first one is: you have referred to the use of synchronous motors. Since when has the synchronous motor come into common use in running mining machinery of the size and character of that of the Perseverance mine with a 200 horse-power motor running a compressor of corresponding capacity?

A. Since when?

Q. Since when; yes.

A. I don't know of particular conditions in synchronous motors of that exact size, but synchronous motors are used, from smaller sizes up, and have been for the last eight or ten years.

Q. Now, I understand you to say that the Alaska-Juneau is taking its power under the present arrangement at unity power factor?

A. That is the way Mr. Proebstil figures that, and that is the way he testified he was figuring it at unity power factor; that is my understanding of it.

Q. Do you know?

A. I have never figured it myself; no.

Q. Do you know anything about the contract?

A. Yes.

Q. Does it call for unity power factor?

(Testimony of R. A. Kinzie.)

A. It does not.

Q. Now, that being the case—when did you order this last inductive [518—452] motor for the Alaska Juneau? A. The last inductive motor?

Q. Inductive motor; yes, sir.

A. That motor was ordered about, oh, I should say, four months ago; something of that sort; four or five months ago.

Q. 200 horse-power motor?

A. Yes; yes; 200 horse-power. Four more motors.

Q. Why didn't you order a synchronous motor for that? A. Why didn't we?

Q. Yes.

A. Because it is not necessary. We are ordering them for the other side. That motor is to be synchronous, too. At the present time—

Q. Which one?

A. —at the present time our plant at the Alaska Juneau mine is a temporary one.

Q. Yes.

A. And the motors that are used there are to be used at other places later on, and they are to be moved around from one place to another. You can use inductive motors for almost any kind of service, but you cannot use a synchronous motor for all kinds of service. A synchronous motor requires a uniform load running equipment.

Q. That is it exactly. Now, you are driving tunnels and doing development work in the Alaska Juneau mine; opening it up?

(Testimony of R. A. Kinzie.)

A. We are driving tunnels, that is all at the present time.

Q. And the motor will probably be used in the development work? A. That motor?

Q. Yes. [519—453]

A. It will be used somewhere; yes; put in stock somewhere; it will be used, very likely.

Q. If the Alaska Juneau is obtaining power at unity power factor and had a synchronous motor, or used a synchronous motor instead of an inductive motor they would gain power thereby, I understand?

A. They would, that is—

Mr. SHACKLEFORD.—That is all.

Redirect Examination.

Q. (By Mr. J. HELLENTHAL.) Mr. Kinzie, the defendant companies, the testimony shows, are furnishing some power at the present time temporarily to the Alaska Juneau Company? A. They are.

Q. I merely want to clear up this matter whether the defendant companies are engaged in the business of selling power or not; whether that is a mere accommodation they are furnishing the Alaska Juneau. A. The defendant companies?

Q. Yes.

A. They are not in the business of selling power.

Q. Neither of the defendant companies?

A. No.

Q. The matter of furnishing the Alaska Juneau with power is merely a temporary accommodation?

A. Simply a convenience until they get their own power started.

(Testimony of R. A. Kinzie.)

Q. You were asked some questions with relation to the Sheep Creek plant. I asked you as to how many horse-power you would require to operate that plant, and Mr. Shackelford has [520—454] asked you as to how many horse-power you would require to operate certain machinery some time at that plant. I wish you would explain to the Court fully what you meant by operating the Sheep Creek plant and what basis you figured the power necessary to operate the plant when—at the time this contract was executed.

A. Well, the way the question was asked—they took up each piece of machinery, good, bad and indifferent, that was in the old power-house on the beach. At the time that the lease was first taken it was understood that the power plant was either to be—in fact, in the first place it was intended for the power plant to be exactly on that site; afterwards change to a point further east. Now, the pieces of machinery that Mr. Shackelford asked about were in that plant. They were in—some of them were in a fairly good condition and some of them were not, and my answers as to horse-power were simply and solely for the pieces of machinery that were there and it was not intended to mean that the aggregate power needed was necessary for the purpose of running the mine at all, because I do not think so.

Q. Now, I wish, Mr. Kinzie, you would explain fully to the Court how much horse-power was necessary to operate the plant at that time, the Sheep

(Testimony of R. A. Kinzie.)

Creek plant, go into where it should be used and what should be done again?

Mr. SHACKLEFORD.—If the Court please, I shall object to the question simply on the ground that it is not redirect examination; matter that they opened up.

The COURT.—I would just as leave they would go into it again, with Mr. Kinzie's attention drawn to the fact that I would be interested to know now. [521—455]

Mr. J. HELLENTHAL.—I asked him about it, Judge, but I didn't go into it as far as I think I should have on direct examination.

The COURT.—Interested to know, now, what the conditions were down at Sheep Creek along prior to August, 1909.

A. (By the WITNESS.) In August, 1909, the properties at Sheep Creek, as well as the property in Silver Bow Basin, were tied up in such a hopeless muddle, both as to the mines and both as to the condition of the mines, the conditions in title, and everything else, that it looked as if the whole enterprise were gone. The mine had caved; the mill was practically in ruins, and the machinery on the beach at the time of the erection of our plant had been removed. At that time if there was any hope of bringing those mines out—the only mines that had been worked, in fact the only mines that had been worked to any extent—I might qualify that statement—were the mines in Silver Bow Basin, in the Sheep Creek Basin. Those mines had taken their

(Testimony of R. A. Kinzie.)

ore to a 30-stamp-mill, first a 20-stamp, then a 30-stamp-mill, just at the end of the middle basin. Now, at the time I speak of, that is, at the end of time, of course all the available ore in those mines so far as the development work had been exacted and if I am correctly informed, and I think I am, there were a number of claimants as to the possession of those mines. There were men representing Colonel Sutherland on the ground; other claimants under the Oxford Company; Malony and others were claiming it and had men on the ground; and what is meant and what I meant that considering those mines in the basin, the mines that had been worked previously, that 200 horse-power was amply sufficient to work those mines, to carry on the development [522—456] work, and the possible recovery of ore and also extract the ore for milling at the 30-stamp-mill, and 300-horse-power would certainly be a great sufficiency.

Q. (By the COURT.) That is what you mean now? A. That is what I always meant.

Q. That is, your statement that 200-horse-power would have been what they figured on at that time to run that machinery?

A. To run, not the machinery then installed, but the proper machinery for operating that mine.

Q. 200 horse-power would have done it?

A. The machinery on the beach was taken away at the time that the Treadwell power plant was built.

Q. No, but you are not answering the question.

(Testimony of R. A. Kinzie.)

I say that 200 horse-power in your impression would have been sufficient to have run the proper machinery to run that property and carry it on?

A. Yes, sir; at that stage, as the size of the mine then existed.

Q. (By Mr. J. HELLENTHAL.) Now, Mr. Kinzie, just a question. I don't know whether I went into this before, but what, if any, notice did you and others connected with your companies give to the plaintiff company and its predecessors as to the manner in which you construed the contract prior to this fall?

Mr. SHACKLEFORD.—Just a moment, was that notice in writing, Mr. Kinzie?

A. I beg your pardon.

Q. The notice in writing.

Mr. J. HELLENTHAL.—I am not speaking of notice in that sense, but what knowledge did you convey to them; that is [523—457] what I mean.

Mr. SHACKLEFORD.—Well, now, Mr. Hellenenthal, I wish to make my objection. I don't want Mr. Kinzie's answers to go into the record as they did the other night.

Q. (By Mr. J. HELLENTHAL.) I will first ask about it. Did you convey any knowledge to the plaintiff company or to its predecessors concerning the construction that you had placed on it?

A. Well, as to exact dates?

Q. Well, just a moment, answer that question.

A. I think so. I would so consider it, yes.

Q. Now, can you tell me on or about what dates

(Testimony of R. A. Kinzie.)

your conversations were—what time they were with relation to the other matters.

Q. (By the COURT.) And to whom?

Q. (By Mr. J. HELLENTHAL.) And to whom?

A. The notice was given to Mr. Shackelford in October, 1910.

Q. In October, 1910? A. Yes.

Q. In what form was that notice?

A. That was either in the form of a letter that had been sent to Professor Corey. I think I spoke of the letter—either that letter or some other letter. I took it to be that particular letter the other evening.

Q. Have you a copy of that letter, Mr. Kinzie?

A. I don't know if I have a copy of that particular letter, but you have a copy of it in your office.

Q. Yes, I know I have.

A. I may have a copy of it here.

Q. (By Mr. SHACKLEFORD.) A copy of Mr. Bradley's letter to Professor Corey? A. Yes.
[524—458]

Mr. SHACKLEFORD.—Yes; I received a copy of that letter.

Mr. J. HELLENTHAL.—I suppose Mr. Shackelford will admit in a general way what the letter contains.

Mr. SHACKLEFORD.—No, I will bring a copy of it up here and present it. I shall object to any oral testimony as to its contents.

Q. (By Mr. J. HELLENTHAL.) All right. Have you got the copy?

A. No; I will find out if this is the particular letter.

(Testimony of R. A. Kinzie.)

I think both letters state the same thing. No, that particular letter is not here.

The COURT.—The attorneys may then submit the copy to me and it will be marked as an exhibit in the case.

Mr. J. HELLENTHAL.—I will produce the copy and let Mr. Shackelford look at it.

Mr. SHACKLEFORD.—If you haven't got a copy, I will bring it up.

The COURT.—Whoever brings it up, let the other one O. K. it.

Mr. SHACKLEFORD.—I will probably have to explain the circumstances under which the letter was written.

Q. (By Mr. J. HELLENTHAL.) Now, Mr. Kinzie, was there any other knowledge conveyed to the plaintiff or its predecessors relative to that matter that you think of?

A. Do you mean before the consolidation at the time?

Q. No; I mean before—before this litigation; before the current was turned on this fall, this last fall.

Q. (By the COURT.) Say before November 8th.

Q. (By Mr. J. HELLENTHAL.) Before November, we will say?

A. Yes; yes, during a conversation with Mr. Wollenberg he was distinctly told that; he was distinctly told the same thing [525—459] in San Francisco by Mr. Brady.

Mr. SHACKLEFORD.—We move to strike that.

Q. (By Mr. J. HELLENTHAL.) That was not

(Testimony of R. A. Kinzie.)

in your personal knowledge?

A. No; that was not in my personal knowledge. I told him so.

The COURT.—The motion is granted as to the conversation of Mr. Brady.

Q. (By Mr. J. HELLENTHAL.) Any other circumstances that you can recall that fact being discussed?

A. No; I don't recall particular instances at this time; no.

Mr. J. HELLENTHAL.—That is all.

Mr. SHACKLEFORD.—If the Court please, I desire to move to strike the witness' testimony with reference to Mr. Wollenberg to save the record on the same point I made the other evening.

The COURT.—Granted that.

Mr. SHACKLEFORD.—I mean the other motion regarding the conversation of Mr. Wollenberg. I thought you granted the motion with reference to the conversation of Mr. Bradley, but Mr. Kinzie's own conversation with Mr. Wollenberg, I move to strike on the same ground as the other, because it lacks authority.

The COURT.—The motion is not granted. Would be hard to say until I review the notes to find out from the testimony what position Mr. Wollenberg had taken with the company in April or March, when you had the conversation.

A. (By the WITNESS.) That was early in March.

Q. March, 1912?

(Testimony of R. A. Kinzie.)

Q. (By Mr. J. HELLENTHAL.) Mr. Kinzie, you know the method properly and generally pursued by mining companies in mining [526—460] operations to take care of their peaks?

A. I do, yes. You mean electrical peaks?

Q. Yes.

A. I know it in a number of cases the way they do it.

Q. How is it done?

A. Well, it depends entirely on the situation and the way that they are buying power. I think I have already illustrated that at the Goldfield Consolidated Company's plant at Goldfield, Nevada, they have put in a large storage battery by which during the periods when they are pulling a low amount of power they store it up in the storage battery and draw from it to diminish the peak. The Bunker Hill and Sullivan Company in Idaho reach the same result by floating in a Curtis (?) turbine on the line. In both instances the power company, the mining company pay for their power on a basis of a certain percentage of the peak load and they are charged on this basis whether they use power during the rest of the month or not.

Mr. HELLENTHAL.—That is all.

Recross-examination.

Q. (By Mr. SHACKLEFORD.) That is under special contract, Mr. Kinzie?

A. Those are special contracts.

Q. Yes, sir. What is the Goldfield and Bunker Hill and Sullivan—what is the period of peak there?

(Testimony of R. A. Kinzie.)

A. It is intermittent. It is likely to come at any time. Their principal peaks, I believe, at the present time are in their hoisting.

Q. That is while they are running certain periods of the day [527—461] they are hoisting?

A. Oh, no, likely to be hoisting at any time of day.

Q. Well when the hoist comes the peak comes?

A. There would be peaks of hoisting; peaks on starting up their machinery of all kinds.

Q. Yes, I understand. What is the principal peak at those places?

A. I understand the principal peak at the Goldfield Consolidated is their hoisting peak.

Q. What about the Bunker Hill and Sullivan?

A. Well, I rather think their peak is due partly to their mill and their hoist. I wouldn't be surprised if it was with the hoist.

Mr. SHACKLEFORD.—That is all.

Mr. J. HELLENTHAL.—It will be all, except the depositions we intend to offer. I presume you will stipulate to take the depositions?

Mr. SHACKLEFORD.—Certainly I have several witnesses' testimony to take on depositions.

Witness excused.

Defendants rest. [528—462]

**[Testimony of H. L. Wollenberg, for Plaintiff
(Recalled).]**

H. L. WOLLENBERG, heretofore duly sworn, being recalled, testified further on behalf of the plaintiff:

Direct Examination.

Q. (By Mr. SHACKLEFORD.) Mr. Wollenberg, the statement has been made by Mr. Kinzie and Mr. Proebstil that if a circuit-breaker was placed by the plaintiff company on their circuit, that all this question about opening and closing the Sheep Creek circuit-breaker would be eliminated. Please explain to the Court what circuit-breakers you have on your line and what their use is.

A. We have installed on the line which we—on which we receive a current from the Treadwell Company a circuit-breaker placed at the gas engine plant which is some half mile distant and is our nearest point to the Sheep Creek power-house where we could place a circuit-breaker. In addition to that at the Perseverance mine the motor is controlled by a time relay circuit-breaker, that is the breaker on the motors are time relay circuit-breakers. Each of these circuit-breakers are so set as to afford us the service that the motor needs to start with. Now, then, it has been testified here that if we put a circuit-breaker on it would go out and not their circuit-breaker, that is only true if the circuit-breaker that we put on is set lower than theirs.

The COURT.—Now, that goes over the same ground. No use of going into testimony of that kind.

(Testimony of H. L. Wollenberg.)

Mr. SHACKLEFORD.—I want to hear what the witness has to say.

A. (By the WITNESS.) Well, it has been reiterated here a great [529—463] many times that if we would put a circuit-breaker on it would eliminate all difficulties. If their circuit-breaker goes out it doesn't allow us to start and it has to be set high enough to give us our service.

The COURT.—That goes without saying.

Q. (By Mr. SHACKLEFORD.) A statement has been made that a circuit-breaker on the Gastineau feeder involves more danger than a similar device on the Alaska-Juneau circuit. What have you to say regarding that matter?

A. I would say as regards danger to the Treadwell system. The loads on each line being approximately equal and similar as regards size of motors and the circuit-breakers in each case being the same, there is absolutely no difference as to the danger to the Treadwell circuit. If upon our Sheep Creek feeder at their power-house was placed an instantaneous circuit-breaker of the same type and same kind and similar in the same way with the one which they use to feed the Snow Slide Gulch tunnel or the other tunnel, it will use in the same manner and will protect them from short circuits or overloads in our line just as it does in the case of the Alaska-Juneau line. That leads me to the subject I have just testified to—is absolutely apparent, cannot be otherwise; the point was made in the testimony that the reason a short could come over our line and hurt the

(Testimony of H. L. Wollenberg.)

motors down in the Treadwell shaft was that we are not working for them, while the men at the Alaska-Juneau were under their control. Now, a circuit-breaker doesn't report—it reports under a certain overload and it doesn't care whether the men around those motors on whose payroll they are.

Q. Now, Mr. Wollenberg, just state to the Court exactly what the [530—464] conditions are at the gas plant which affect synchronism. Just state it as briefly as to your efforts and whether they have been successful.

A. I will first repeat that I professionally testified that the gas engine could be synchronized with any other source of power of the same cycles and same characteristics, but that it would be very difficult and to support my opinion I would like to describe the conditions of gas engines and the conditions in general that surrounds synchronism. In the first instance, the gas engine which we are using was originally built for producing gas. It was purchased by previous owners of the property. It was set up down there but never completely installed or run. When we took it over we were warned by the very people who sold the engine and the producer that it would not work; that the producer sold with it had been a failure and they advised us not to try it, and being particularly in need of power we worked out a scheme to convert it into a distillate engine to use as a winter auxiliary. We changed the size of the cylinders; changed the governor, and put on carbureters, and did all the other things necessary and have succeeded

(Testimony of H. L. Wollenberg.)

in making it work; but it has inherent difficulties in regulation and in governing that make it a difficult matter to synchronize it with any plant. Now, when we put the generator there—further we desired or expected to synchronize it with our own water system, and the switchboard is provided with all the devices in synchronism to synchronize instruments, the indicators that are necessary and sufficient for synchronism. However, in case of synchronism between any two plants, and particularly between a [531—465] plant that it operated and has pulsations in the imputing of the energy, such as a gas engine, it is difficult to synchronize. We made several attempts, but, as previously testified, on the very day that we were making it, requested when we requested that the man sent from Treadwell stay at the Sheep Creek plant until we made another attempt, he left and we were unsuccessful, and he went back and we waited some three hours to get it back on. Now, I have no doubt, any more than the other witnesses testifying, it is possible to do it, but it is extremely difficult and certainly not possible to do so under the conditions we are working.

Q. If it would, it wouldn't relate to the power factor question at all? A. Absolutely not.

Q. Now, Mr. Proebstil has testified that synchronous motors operated as condensers are not installed by power companies on the premises of their consumers in order to raise their power factor and aid their generator plants. Will you kindly state what that situation is and what the practice is and

(Testimony of H. L. Wollenberg.)

give to the Court the source of your information?

A. Well, the effect of power factor in lessening generator capacity and in affecting losses on transmission lines in almost every case presents the increase of that power factor is for the benefit of the generator company and is not a thing which they can charge up to the consumers, because in every case of which I have any knowledge, power is sold to the consumer on a wattmeter reading, and in the wattmeter reading the power factor is taken into account and the consumer pays for the power he gets. It is therefore to the advantage of the generator company to have the power factor high. In recognition [532—466] of that generator companies have gone so far as to install synchronous motors on the premises of their consumers. Now, the reason that they install them on the premises of the consumer in some cases is in order to get the corrective effect of the synchronous motor. The feasible place is the end of the line as far from the generator as possible and not in line. They will frequently be synchronous motors at their substations. In case substations are not convenient they put them on the premises of the consumer. In these cases the synchronous motor is generally run without load, as a synchronous condenser which was described by Mr. Proebstil and in fact its corrective effect is very high; when run as a synchronous motor it has only a certain corrective effect, but when run light it has a very large corrective effect.

Q. I wish you would give to the Court the source

(Testimony of H. L. Wollenberg.)

of your authority and read it into the record.

A. I would like to read from Bulletin No. 4859, of the General Electric Company.

Q. (By the COURT.) Of what date?

A. Of August, 1911.

Q. (By Mr. SHACKLEFORD.) Go ahead.

A. I am reading from page 8: "The Cleveland Electric Illuminating Company—"

Q. (By Mr. J. HELLENTHAL.) What is this. Just a bulletin of the General Electric Company?

A. This is just a bulletin of the General Electric Company.

Mr. J. HELLENTHAL.—I object to that as incompetent, irrelevant and immaterial. I will say not authoritative. Look upon that page; merely an advertising pamphlet.

Q. (By Mr. SHACKLEFORD.) I will ask you, Mr. Wollenberg, just to [533—467] state what the use of that bulletin is in following the progress of development in electrical science before the books make their appearance.

A. I will state that a publication of the General Electric Company containing descriptions of installations of motors and purposes for which they are installed is as authoritative source of information as any publication and will not be contradicted or accepted by any engineer in the country.

Q. Or rejected?

A. Or rejected. I am not speaking of its claim of efficiency, what is their practice, but as regards the description of certain apparatus their statement

(Testimony of H. L. Wollenberg.)

for it is absolutely reliable.

The COURT.—You may proceed.

Mr. SHACKLEFORD.—Just go ahead and read that.

A. (By the WITNESS, reading from bulletin.)—
“The Cleveland Electric Illuminating Company was one of the first central stations to give a practical demonstration on an extended scale of the value of synchronous condensers in raising the power factor of systems carrying a heavy inductive load. Their installations exemplify the use of unloaded synchronous motors simply ‘floated’ on the system to supply leading current to the line and of partially loaded synchronous motors for the same purpose. In order to gain a comprehensive idea of the results obtained by the Cleveland Electric Illuminating Company, a brief description of the generating and transmission system is necessary. Situated in the city of Cleveland, Ohio, which has an estimated population of 515,000, and extends, with its suburbs, along Lake Erie for about 17 miles, the generating station, with its substations, serves a [534—468] territory of approximately 50 square miles. The steam-driven generating station is located on Canal Street, near the business center of the city. The generating units now in service consist of two 9000 kw. and one 500 kw. Curtis turbo-generator sets of General Electric manufacture, delivering energy at 11,000 volts, three-phase, 60 cycles. There are, in addition, same reciprocating engine-driven generators, delivering energy at 2300 volts, three-phase, 60 cycles. Trans-

(Testimony of H. L. Wollenberg.)

forms set-up the e.m.f. to 11,000 volts for the substations. In addition to the alternating current equipment there are three 1500 kw. motor-generator sets and direct current reciprocating engine sets and a storage battery. The energy for that part of the city immediately surrounding the generating station is distributed on a direct current, three-wire Edison system. The balance is practically all alternating current, and is distributed to the substations at 11,000 volts, and redistributed at 2300 volts, three-phase, 60 cycles. There are six substations, five of them being straight transformer stations, and the sixth being provided with a motor-generator set and battery in addition to the transformer equipment; and the total distance between the two end substations is about 15 miles. All of the 11,000 volt circuits are underground. The distribution circuits from the substation at 2300 volts for motors and lamps are underground cables for a short distance from the stations, where they join to pole lines. The secondary lighting circuits are three-wire, single-phase, 115 volts to 230 volts, and motors up to 5 h. p. are operated from the lighting circuits. The general inductive distribution is at three-phase, 2300 volts, the e.m.f. being stepped-down to 460 volts and 230 volts at the customer's [535—469] premises. The motors are nearly all three-phase, but some two-phase motors are run from three-phase transformers by means of a T-connection. The ratio of alternating current to direct current load is about 2.5. to 1. The arc lighting load is nearly all carried by Brush arc generator

(Testimony of H. L. Wollenberg.)

sets. It will be seen from the above that the operating conditions confronting the Cleveland Electric Illuminating Company are those which are ordinarily encountered by any central station located in a manufacturing city. The fact that more than 40 per cent of the connected load consisted of induction motors, which were frequently loaded far below their rated output, had a very noticeable effect on the power-factor of the system, this effect being augmented by the numerous transformers located in the substations and on the customer's premises. So serious was this that the power-factors of the entire system before the rotary condensers were installed varied between 65 and 70 per cent during the day, and at night when the motor load was practically discontinued and the lighting load substituted, it rose to between 85 and 90 per cent. Realizing that these conditions affected both the permissible output and the regulation of the entire system, it was determined to bring the power-factor as close to unity as was economically possible by the installation of synchronous condensers in those substations feeding induction motor installations, and also in the factories of large motor users. Two 2300 volt synchronous condensers of 750 kv-a. rating and provided with directly connected exciters were therefore installed in one substation, and a third unit of the same rating was provided for a second substation. In addition to these, four 200 kv-a. General Electric synchronous condensers with direct [536—470] connected exciters were connected to the low tension side of the transformers on the

(Testimony of H. L. Wollenberg.)

customer's premises; the largest motor users on the various distribution lines being selected for the installation of these units. As auxiliaries to the synchronous condensers, a number of synchronous motors partially loaded were installed, the kilowatt load delivered to the shaft varying from 50 to 75 per cent of the kv-a. rating of the motor. These motors are used to drive alternating current or direct current generators for special purposes, and are the property of the customer, while the 200 kv-a. synchronous condensers referred to above and installed on the customer's premises belong to the illuminating company. The General Electric 200 kv-a. condenser has been adopted as standard for future installations in customer's plants, but will not be provided except where the power taken is in excess of 400 h. p. While this is not theoretically the best method, it was considered advisable to have a single standard condenser placed in service where conditions warranted its use, instead of working out in detail a large number of various condenser ratings. The condensers thus installed are carefully inspected at frequent intervals by representatives of the illuminating company, but are normally operated by the customers, who are glad to provide the necessary room in their plants, as they benefit from the improved regulation." That is all that applies to that.

Q. Now, I asked you the other day about the power consumption at the Sheep Creek mines as evidenced by the machinery installed there at the time this contract was made. I think [537—471] you men-

(Testimony of H. L. Wollenberg.)

tioned a thirty-stamp mill and compressor plant, and I want to ask you a question: In that estimate of power if you referred to the terms of actual power?

A. Certainly did.

Q. Now, the Sheep Creek—you have been on the Sheep Creek mine? A. I have.

Q. Were they in such condition that a reduction of power which previously had been used there would have been advantageous or possible even if the mine had been started up again?

A. Well, the fact that the developed ore was largely extracted meant that in reopening the mine a large amount of development work would be immediately necessary—there would be an abnormal large amount of development work as referred to the normal operation, and therefore I should say that the conditions of the mine indicate that in reopening it a larger amount of power would be needed than would run it in its normal condition.

Q. Among other things, the first thing, in reopening that mine, to be done with it the added tunnels they would run out to reach the ore body?

A. Exactly; started at that time.

Q. And what about the compressor capacity required for that work and for the other necessary development work in comparison with the compressor capacity which existed on the plant at the time and which Mr. Kinzie is now using at the Alaska-Juneau?

A. I should say that it would be at least as much; in fact Mr. Kinzie is using that compressor and driving a tunnel and were a tunnel of the same size to be

(Testimony of H. L. Wollenberg.)

driven at Sheep Creek it would require a similar output of air. [538—472]

Q. Now, Mr. Proebstil made a statement to me the other day that it would be impossible to determine the power factor or to determine the point at which the circuit-breaker should be set by a reading of the wattmeter. What have you to say with reference to that statement?

A. To determine the power factor on a circuit you would have to have a reading from the wattmeter and at the same time a reading from the ammeter and voltameter on the same circuit. With those three readings the power factor is absolutely determined.

Q. And in answer to another question he said that the necessary and proper way would be to use, assuming the power called for in this contract to be real power, would be to use a power factor determiner.

A. A power factor indicator.

Q. Yes.

A. There is such an instrument. It is equally useful for the purpose. It is an alternative method.

Q. Well, the other method may be used?

A. Either method is correct.

Q. Now, I wish you would describe to the Court exactly how you would proceed to determine the point at which a circuit-breaker, which we claim should be installed there, would be put in and the conditions which would influence it from time to time.

Mr. J. HELLENTHAL.—Now, if your Honor please, I object to that as having all been gone over in the case in chief.

(Testimony of H. L. Wollenberg.)

The COURT.—Repetition absolutely.

Mr. SHACKLEFORD.—I am simply asking the same privilege that counsel asked with reference to Mr. Kinzie and will [539—473] only take a moment.

The COURT.—Let's eliminate all this.

Q. (By Mr. SHACKLEFORD.) I will ask you this, Mr. Wollenberg, if the power factor having been determined by use of wattmeter, ammeter and voltmeter, at a time when the wattmeter showed the consumption of 300 horse-power, how would you then set your circuit-breaker?

Mr. S. HELLENTHAL.—All been gone into, Judge.

Mr. SHACKLEFORD.—All right, I will leave that last question to accommodate you and save time.

Q. Power factor having been determined in the reading of the contract of 300 horse-power, the claim has been made all through this case in a vague sort of a way by Mr. Hellenthal that the power factor is so changeable that no suitable or reasonably suitable conclusion could be reached from its determination at any one time. Now, I want you to explain to the Court what the condition is with reference to the variation of power factor after it has once been determined at the height of consumption called for in the contract.

Mr. S. HELLENTHAL.—Object to that; all been gone into.

The COURT.—No, I think probably there is a little question in my mind under the testimony as to

(Testimony of H. L. Wollenberg.)

whether there is a normal power factor at the Perseverance mine at the present conditions, whether it remains the same any one day and any one hour or within how much of a radius.

Mr. SHACKLEFORD.—Yes, sir.

Q. You understand the question?

A. I understand the question. If the power factor were determined [540—474] at a time at which we were drawing 300 horse-power it would represent a time at which we would have fully loaded the various motors and other devices which we would have upon the Treadwell circuit.

Q. (By the COURT.) Consider the lamps, these lights, what their air-compressor is running, your air-compressor, take those things into consideration.

A. Exactly, the air-compressor and lights do not consume 300 horse-power and so some other motor or other form would be added for that 300 horse-power. Only those definite machines are upon the line at the time at which they are taking their full load and at which their sum is 300 horse-power, that has a definite power factor. The chief cause of variation of power factor is the state of the load on the machine, whether the machine is fully loaded or partly loaded, and it has its highest power factor when loaded at its rated capacity.

The COURT.—I would rather you would answer the question. Can you say how near is the power factor maintained under your present conditions used there from day to day?

Mr. SHACKLEFORD.—I think, if your Honor

(Testimony of H. L. Wollenberg.)

please, that if the witness may proceed can be made clearer without interruptions.

The COURT.—It is hypothetical so far, you see. I would rather it wouldn't be that. Make it practical.

Q. (By Mr. SHACKLEFORD.) Well, Mr. Wollenberg, just explain to the Court in the best way the variation of the power factor. [541—475]

A. I think I can in a moment. In the event that no conditions would show them to be overloaded, no air was being taken from the compressor, the motor would be doing a very little work, the power factor of the motor would be low; therefore the power factor of the system would be low, but at such time our horse-power required by the plant is low and although the power factor is low it has no influence on the setting of the circuit-breaker because it is a condition of underload. Now, the point as to whether or not that fact, if the circuit-breaker was set at a condition of 300 horse-power or full load, this condition would be necessarily standard, and would be subject to very little variations excepting that we would have completely take the motor that we are at present using out and put in a synchronous motor or some other motor in. You understand that would be making a complete change, but without a change in amperage now used at that particular plant the power factor would be subject to very slight variations. I cannot calculate it positively but I would say it would be a very few per cent, because under full load conditions there is no in-

(Testimony of H. L. Wollenberg.)

fluence calling for any other variation.

Q. (By the COURT.) Well, let me put the question. You are trying the case before me. I will have to be satisfied ultimately. I will put the question this way: How would you at the present time determine your power factor over to the Perseverance mine?

A. I would take a reading of the wattmeter, of the circuit—we will say that the wattmeter reading is the equivalent of 210 horse-power; I would then read the voltameter and ammeter at the same time, make the three readings as nearly together as possible. [542—476]

Q. How would it compare with the usual—well, if you were to get the—you have already explained several times how you would reach the power factor, but how would it show, for instance, in your opinion, if you were to take these readings every hour for twenty-four hours?

A. Provided always the load stayed the same?

Q. Just stayed as it ordinarily is.

Q. (By Mr. SHACKLEFORD.) Now, Mr. Wollenberg, when you are running at heavy load and your power factor is load, what effect would that have on the circuit-breaker set—

A. Well, if we were running at heavy load has no effect on the circuit-breaker because the circuit-breaker is set for full load and have got your line losses and other conditions.

Q. (By the COURT.) Letting the circuit-breaker in connection entirely out, what would your

(Testimony of H. L. Wollenberg.)

power factor be for every hour in the twenty-four hours?

A. Well, I will answer that, when the compressor was running and supplying a normal output of air for the mine, the power factor would not vary appreciably; if it varied it would only vary as the wattmeter reading also went down; in other words, if it would be within the first case I have got to assume that a condition may occur at the mine when nobody happened to take any air from that compressor; you say, at such time that motor is running at a very low load and has a very low power factor for that has no bearing on the setting of the circuit-breaker. If you would allow me to assume that the compressor runs twenty-four hours at a normal output and other conditions [543—477] were normal, I think then I could immediately answer you that the variation in power factor would be nothing. Now, my plan is this: If you determine things for the maximum conditions you are not concerned with those variations because those variations will be down; in other words, then that will be less than that, for under load conditions, but the wattmeter reading at that time is also low and you would not reach the limits of your circuit-breaker under load conditions. Have I made myself clear on that?

Q. (By Mr. SHACKLEFORD.) I think that is all, Mr. Wollenberg. I will ask you one more question on that point, so to get it the way I had it and get it into the record. If the power factor is 70 at

(Testimony of H. L. Wollenberg.)

full load, as the evidence in this case shows, the ammeter setting of the circuit-breaker would be eighty ammeters, I understand? A. Exactly.

Q. Now, if the circuit-breaker is set at 80 amperes, will any variation in the power factor in ordinary course of business, any lowering of the power factor in the ordinary course of business, change that setting so that we are not entitled to 80 amperes or so that we would be drawing more than 80 amperes?

A. I don't understand your question.

Q. Well, if the circuit-breaker were set at 80 amperes— A. Amperes.

Q. Amperes, I mean, and you slowed down for instance at any moment—well I mean your power factor becomes extremely low—

The COURT.—Say 50 instead of 70. [544—478]

Q. (By Mr. SHACKLEFORD.) 50 instead of 70? A. Yes.

Q. You would then be drawing much less in horsepower? A. Certainly very much less.

Q. And the lowering of that power factor would not affect the maximum at which the circuit-breaker should be set? A. Not at all; not at all.

Q. Not only practically, but it would not affect—you would not be getting any more than you are entitled to? A. You would not.

Q. The lowering the power factor, as I understand it, having determined it once, comes only from those conditions when you cease to consume as much power as you are entitled to? A. That is my idea.

(Testimony of H. L. Wollenberg.)

Mr. SHACKLEFORD.—I think that is all.

Cross-examination.

Q. (By Mr. J. HELLENTHAL.) When the machine finds out that you are not getting all the power you are entitled to, the power factor goes down; is that right?

A. You don't expect me to answer that. You mean to be funny.

Q. I don't know whether that is your answer to Mr. Shackleford's last question.

A. Well, the Judge don't expect me to answer that.

The COURT.—You don't need to waste any time on that Mr. Hellenthal.

Q. (By Mr. J. HELLENTHAL.) Mr. Wollenberg, you mean to say [545—479] that the power factor that changes or varies all the time, varies only when you are not getting all the power you are entitled to; is that right? A. I do not say that.

Q. What do you say?

A. I said that the power factor of the motors was affected only by the proportion of load which you are carrying.

Q. Yes.

A. That is exactly what I said, and I said that under the conditions on our line, the maximum conditions determining their power factor, and as long as those maximum conditions were maintained the power factor would remain constant, practically constant; that is what I said.

Q. You mean to say now—isn't this a fact, that

(Testimony of H. L. Wollenberg.)

your power factor is the highest when your machine is run at its exact capacity?

A. Its rated load, it is highest.

Q. At its rated load it is highest?

A. I would say that.

Q. You overtax your machine sometimes, don't you?

A. Yes; but the 300 horse-power rate which we are speaking of would have to be the limit of overtaxing that machine.

Q. So the 300 horse-power that you are speaking of would have to be the highest possible point that you could get to?

A. The 300 horse-power limit which would be reached when this ammeter was read and the wattmeter read and the power factor determined—

Q. I see.

A. —would have to be the highest point we could reach and [546—480] stay within 300 horse-power.

Q. I see.

A. And our suggestion for having a time relay circuit-breaker, which instrument if we should exceed 300 horse-power from the predetermined length of time would open the circuit and so serve notice on us that we had exceeded it.

Mr. J. HELLENTHAL.—That is all.

Mr. SHACKLEFORD.—That is all. That is all the testimony we have to offer at this time.

Witness excused. [547—481]

[Plaintiff's Exhibit No. 4 for Identification.]

“A. G. Co. vs. A. T. Co. et al., Plffs. Ex. 4 for Ident. R. E. R.—Recd. R. E. R.

UNITED STATES OF AMERICA.

STATE OF NEW YORK.

BY EDWARD LAZANSKY.

Secretary of State and Custodian of the Great Seal
Thereof.

IT IS HEREBY CERTIFIED, that Jose E. Pidgeon was, on the day of the date of the annexed Certificate and Attestation, Second Deputy Secretary of State of the State of New York, and duly authorized by the laws of said State to make such Attestation and Certificate and to perform the duties belonging to the Secretary of State in making such Attestation and Certificate, in like manner as said Secretary of State; that the said Certificate and Attestation are in due form and executed by the proper officer; that the seal affixed to said Certificate and Attestation is the seal of office of the Secretary of State of the State of New York; that the signature thereto of the said Second Deputy Secretary of State is in his own proper handwriting, and is genuine; and that full faith and credit may and ought to be given to his official acts; and, further, that the Secretary of State is the Custodian of the Original Law so certified and attested and Custodian of the Great Seal of said State, hereunto affixed.

[The Great Seal of the State of New York.]

IN TESTIMONY WHEREOF, the Great Seal of the State is hereunto affixed.

WITNESS my hand and seal at the city of Albany, the eighth day of August, in the year of our Lord one thousand nine hundred and twelve.
[548—482]

EDWARD LAZANSKY,
Secretary of State.

Chap. 61.

AN ACT Relating to stock corporations, constituting chapter fifty-nine of the consolidated laws.

Became a Law Feb. 17, 1909, with the approval of the governor. Passed, three-fifths being present.

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Chapter 59 of the Consolidated Laws.

Stock Corporation Law.

Article 2. General provisions (§§ 5-18).

Article 2.

General Provisions.

Section 15. Merger.

§ 15. MERGER. Any domestic stock corporation and any foreign stock corporation authorized to do business in this state lawfully owning all the stock of any other stock corporation organized for, or engaged in business similar or incidental to that of the possessor corporation may file in the office of the Secretary of State, under its common seal, a certificate of such ownership, and of the resolution of its board of directors to merge such other corporations, and thereupon it shall acquire and become, and be possessed of all the estate, property, rights, privileges and franchises of such other corporation, and they shall vest in and be held and

enjoyed by it as fully and entirely and without change or diminution as the same were before held and enjoyed by such other corporation, and be managed and controlled by the board of directors of such possessor corporation, and in its name, but without prejudice [549—483] to any liabilities of such other corporation or the rights of any creditors thereof. Any bridge corporation may be merged under this section with any railroad corporation which shall have acquired the right by contract to run its cars over the bridge of such bridge corporation.

(Form 108. 1-25-12-1000 (2-11743) A108.

State of New York,

Office of the Secretary of State,—ss.

I have compared the preceding copy of Section 15 of the Stock Corporation Law, Chapter 61 of the Laws of 1909 with the original Law on file in this office, and do hereby certify that the same is a correct transcript therefrom and of the whole of said section.

Given under my hand and the seal of Office of the Secretary of State, at the City of Albany, this eighth day of August, in the year one thousand nine hundred and twelve.

JOSE E. PIDGEON,

Second Deputy Secretary of State.

[Seal—State of New York, Secretary of State.]

[Endorsed]: Filed Aug. 20, 1912. E. W. Pettit, Clerk. By J. J. Clarke, Deputy" [550—484]

[**Plaintiff's Exhibit No. 5.**]

"A. G. C. vs. A. T. Co. et al. Plffs. Ex. 5. R. E.
R.

((COPY))

"UNITED STATES OF AMERICA,
STATE OF NEW YORK.

By

EDWARD LAXANSKY,

Secretary of State and Custodian of the Great Seal
thereof.

IT IS HEREBY CERTIFIED, that Jose E. Pidgeon was, on the day of the date of the annexed Certificate and Attestation, Second Deputy Secretary of State of the State of New York, and duly authorized by the laws of said State to make such Attestation and Certificate and to perform the duties belonging to the Secretary of State in making such Attestation and Certificate, in like manner as said Secretary of State; that the said Certificate and Attestation are in due form and executed by the proper officer; that the seal affixed to said Certificate and Attestation is the seal of office of the Secretary of State of the State of New York; that the signature thereto of the said Second Deputy Secretary of State is in his own proper handwriting, and is genuine; and that full faith and credit may and ought to be given to his official acts; and, further, that the Secretary of State is the Custodian of the original Certificate of Merger so certified and attested and Custodian of the Great Seal of said State, hereunto affixed.

[The Great Seal of the State of New York.]

IN TESTIMONY WHEREOF, the Great Seal of the State is hereunto affixed.

WITNESS my hand at the city of Albany, the eighth day of July, in the year of our Lord one thousand nine hundred [551—485] and twelve.

EDWARD LAZANSKY,
Secretary of State.

CERTIFICATE OF MERGER BY THE ALASKA
GASTINEAU MINING COMPANY FOR
THE MERGING OF THE ALASKA-PERSE-
VERANCE MINING COMPANY.

The Alaska Gastineau Mining Company, pursuant to the provisions of Section 15 of the Stock Corporation Law of the State of New York, hereby certifies, under its common seal, as follows:

First, that the Alaska Gastineau Mining Company is a stock corporation, organized and existing under the laws of the State of New York, and that its certificate of incorporation was duly filed and recorded in the office of the Secretary of State of said State on the 14th day of January, 1911, and a duplicate of said certificate of incorporation was also filed and recorded in the office of the Clerk of New York County, in said State on the 16th day of January, 1911.

Second: That on and prior to January 31, 1911, the Alaska Perseverance Mining Company was also a stock corporation organized and existing under the laws of the State of New York, and that its certificate of incorporation was duly filed and recorded in the office of the Secretary of State of said State on or about the 17th day of July, 1901, and in the office of

the Clerk of New York County in said State on or about July 18th, 1901.

Third: That on said January 31, 1911, the Alaska Gastineau Mining Company lawfully owned all the capital stock of said Alaska Perseverance Mining Company, and on that day the directors of the said Alaska Gastineau Mining Company, by [552—486] resolution, duly adopted, determined to and did merge said Alaska-Perseverance Mining Company, which resolution was as follows, to wit:

Whereas, the Alaska Gastineau Mining Company was organized for business similar to that of the Alaska-Perseverance Mining Company; and

Whereas, the said Alaska Gastineau Mining Company has acquired and now lawfully owns all the stock of said corporation and desires to merge the said Alaska-Perseverance Mining Company, and to be possessed of all the estate, property, rights, privileges and franchises of said corporation;

Now, therefore, Resolved, that the Alaska Gastineau Mining Company merge and it hereby does merge said Alaska-Perseverance Mining Company; and

Further Resolved, that the officers of this company be, and they hereby are authorized and directed to make and execute, under the common seal of this company, a certificate of such ownership, and of the adoption of this resolution of the board of directors of this company to merge the said Alaska-Perseverance Mining Company pursuant to statute.

In Witness Whereof, the Alaska-Gastineau Mining Company has caused this certificate to be signed in

its behalf by its president, and its common or corporate seal to be hereunto affixed and attested by its secretary, on the 31st day of January, 1911.

[Corporate Seal]

ALASKA GASTINEAU MINING COMPANY,
By W. J. SUTHERLAND,
President.

Attest:

B. LIDDLE,
Secretary.

State of New York,

County of New York,—ss. [553—487]

On this 31st day of January, 1911, before me personally came William J. Sutherland, to me known, who, being duly sworn, did depose and say that he resides in the City of London, England; that he is the President of the Alaska Gastineau Mining Company, the corporation described in and which executed the above instrument; that he knows the seal of said corporation; that the seal affixed to said instrument is such corporate seal; that it was so affixed by order of the board of directors of said corporation, and that he signed his name thereto by like order.

[Notarial Seal]

HENRY E. GOERICKE,
Notary Public, New York County.

[Endorsed]: Certificate of Merger by the Alaska Gastineau Mining Company Merging the Alaska-Perseverance Mining Company. Filed and recorded Feb. 1, 1911. Edward Lazansky, Secretary of State.

(Form 37, 12-6-11-1000 (2-10215) (Corporation Bureau) 459A

State of New York,

Office of the Secretary of State,—ss.

I have compared the preceding with the original certificate of merger of Alaska-Perseverance Mining Company with the Alaska-Gastineau Mining Company, filed and recorded in this office on the 1st day of February, 1911, and do hereby certify the same to be a correct transcript therefrom and of the whole thereof.

[Seal—State of New York Secretary of State]

Witness my hand and the seal of office of the Secretary of State, at the city of Albany, this eighth day of July, one thousand nine hundred and twelve.

[554—488]

JOSE E. PIDGEON,

Second Deputy Secretary of State.

[Endorsed]: Filed Aug. 20, 1912. E. W. Pettit, Clerk. By J. J. Clarke, Deputy.” [555—489]

[Proceedings Had February 8, 1913, 2 P. M.]

On February 8, 1913, at two o'clock in the afternoon thereof, further proceedings in said cause were had, as follows, the plaintiff appearing by its attorney, L. P. Shackelford, Esq., and the defendants appearing by their attorney, S. Hellenthal, Esq.

The COURT.—I understand that the testimony will be concluded this afternoon on both sides.

Mr. SHACKLEFORD.—The case is open, I understand, now only for the depositions.

The COURT.—That is your understanding?

Mr. S. HELLENTHAL.—That is our understanding.

Mr. SHACKLEFORD.—An examination of the testimony shows that there is a letter here from Professor Corey and reserved the right to explain the circumstances.

Mr. S. HELLENTHAL.—No exception except those have already been taken to this when offered, your Honor.

Mr. SHACKLEFORD.—We will offer first the original letter of August 10, 1909, from F. W. Bradley to Henry Endicott, a copy of which has already been offered (copied in transcript of testimony at page 8). We will offer also the original telegram of August 25 from F. W. Bradley to Henry Endicott (copied in transcript of testimony at page 9); and at the time the copies were introduced in connection with my testimony at the opening of the case I also offered a copy of a telegram from Henry Endicott, dated August 23, 1909, to F. W. Bradley, the original of which I haven't. It is in Mr. Bradley's possession and with that we resume the offer of the two telegrams and the letter. The record shows that the matter was held in reservation until Mr. Hellenthal has seen the copy and he has never approved it yet. [556—490]

The COURT.—I see. You are not able at this time to give the originals?

Mr. S. HELLENTHAL.—I don't think we are. May be able to before the case is finally submitted.

The COURT.—The originals, of course, may be admitted, but the others you speak of will be admitted in evidence and will be evidence in the case unless you supply the originals.

Mr. S. HELLENTHAL.—That is all right, your Honor.

(Plaintiff's Exhibits 1A and 3A received and marked—copied in record pages 8 and 9.)

[Plaintiff's Exhibit No. 6.]

(Plaintiff's Exhibit 6 received and marked.)

“A. G. Co. vs. A. T. C. M. Co. et al. Plffs. Ex. 6.
R. E. R. A. Power.

(COPY)

San Francisco, Cal., October 31, 1910.

Professor C. L. Cory,
Union Trust Building,
San Francisco.

My dear Professor:

The Alaska Treadwell and allied mining companies have leased a water power property to which they have added other property of their own and have since developed and equipped the whole with a generating plant and are now transmitting 2000 K. W. from this plant to their mines.

The lessor or owner of a portion of the water power property interprets the lease as follows:

‘That he has the option to either take 300 electric [557—491] horse power from and at our generating plant, or else to accept the sum of \$25,000.00 in complete payment for his property.’

The lessor construing the lease in this way, believes that the 300 electric horse power from and at the generating plant is of greater value than the sum of \$25,000.00. Assuming that the lessor has the right to take 300 electric horse power from and at the gen-

erating plant subject to all operating and physical conditions beyond our control, I wish your opinion as to the present cash value of the same under the following conditions:

First: The total cost of the above hydro-electric 200 K. W. plant with electric power delivered at the mines seven to eight months per year has amounted to \$50. per horse-power.

Second: During the seven to eight months each year there is more than sufficient water to run the plant to full capacity. During the remaining four to five months there will not be enough water to make the full 300 electric horse power. That is, for at least four months each year, the plant may not be able to average over 100 electric horse power—this is a physical cause beyond our control.

Third: We have built a 2000 K. W. steam electric relay plant at a capital cost of \$50.00 per horse power. With fuel oil delivered at 90¢ per barrel, we estimate that the total operating cost of this steam relay plant will not exceed \$35.00 per horse power per year.

Fourth: We are developing another water power [558—492] which we own outright and will provide it with ample storage so as to have an all-the-year-round power. The capital cost of this plant delivering electric power at the mines twelve months per year will be about \$135.00 per horse power.

Fifth: We will still need power in addition to what all the foregoing installations will provide, but can secure it by slightly increasing the capacity of any of the above mentioned plants.

If the lessor is right in his contention that he can

demand the 300 electric horse power at the generating plant and sell it to the highest bidder, what price in your opinion would we be justified in offering him for it? You must consider that if this 300 electric horse power is sold to any outsider, the outsider will have to build his own transmission line four miles to the nearest market, the power will only be good eight months per year and his peak loads cannot exceed 300 electric horse power at the generating plant.

Yours very truly,

F. W. B."

**[Testimony of L. P. Shackleford, for Plaintiff
(Recalled).]**

Mr. SHACKLEFORD, heretofore duly sworn, testified as follows: And then, if your Honor please, I made the statement in the record that I would supply a copy of the letter of F. W. Bradley to Professor C. L. Cory dated October 31, 1910, and in that connection I will have to make a statement. (Took the witness-stand.) On the 31st of October, 1910, I was in Mr. Taylor's office. Mr. Taylor was then the president of the defendant companies and I gave him notice on that date that we would elect to take the horse-power provided in the contract and he then said that it was the desire of the defendant companies to absorb [559—493] the contract, buy it and he asked Mr. Bradley what the value of a horse-power per annum was up here and Mr. Bradley stated it was \$40.00; then multiplied the \$40.00 by 300 and asked me what the legal rate of interest was up here, and I told him it was eight per cent; he then put down on his tablet \$150,000.00, and said to Mr. Bradley that was

(Testimony of L. P. Shackleford.)

apparently the value of the contract. Mr. Bradley then stated for the first time that he didn't considered—that he considered the contract worth less than \$50,000.00, probably about \$25,000, and I told him that we wouldn't entertain the proposition at all for less than \$125,000.00. Under Mr. Taylor's instructions Mr. Bradley then wrote this letter to Professor Cory, or Mr. Taylor told him to write Professor Cory and secure a statement from Cory as to his opinion of the value of the contract.

The COURT.—This was done in your presence?

Mr. SHACKLEFORD.—Yes.

Mr. S. HELLENTHAL.—If your Honor please, I make no objection to this statement as being preliminary to the introduction of this letter, but if it is used for any other purpose I would like the liberty to refute that afterwards, your Honor.

Mr. SHACKLEFORD.—The next morning—I wasn't a party to the letter to Professor Cory and had nothing to do with it except that this statement was made in my presence and the next morning Mr. Bradley mailed me a copy of the letter which he had written Professor Cory and I have never seen any of the rest of the correspondence and this is the letter written to Professor Cory on that [560—494] date. Subsequently in February Mr. Bradley offered to take the contract over for \$25,000.00 and we declined to sell it.

The COURT.—That was in February, 1911?

Mr. SHACKLEFORD.—Yes; and at no time have we offered to sell the contract for \$25,000.00 or for any sum less than \$125,000.00 that I know of. That

is all, your Honor.

Mr. S. HELLENTHAL.—That is all, your Honor, only I want to reserve the right, if this should be used for any other purpose, that we should have a right to refute it.

Mr. SHACKLEFORD.—I have given the testimony in this case very largely because some of the questions addressed to Mr. Bradley may bring out something relating to the same matter.

Mr. S. HELLENTHAL.—Then, we have no further testimony.

Mr. SHACKLEFORD.—There was a sketch here that Mr. Wollenberg used in connection with his explanation of the plaintiff's power system, to which the Reporter called my attention that has not been offered.

The COURT.—Used at the hearing?

Mr. SHACKLEFORD.—Yes.

The COURT.—May be admitted in evidence. (Plaintiff's Exhibit No. 7.)

Mr. S. HELLENTHAL.—I don't know of anything more.

Mr. SHACKLEFORD.—With that exception and with the exception of such depositions as may arrive I think that ends the testimony.

The COURT.—When will those depositions be likely to be in?

Mr. SHACKLEFORD.—Left here about a week ago. I will state further, if your Honor please, that I desire to [561—495] enter the general objection to all the questions asked by the defendants, that the questions are incompetent, irrelevant and immaterial, and then let the depositions be read by your

Honor subject to that objection.

The COURT.—So ordered.

Finis. [562]

Certificate [of Official Stenographer to Evidence].

United States of America,
District of Alaska,
Division Number One,—ss.

I, R. E. Robertson, do hereby certify that the foregoing and hereto attached 496 pages of typewritten matter, numbered from 1 to 496, both inclusive, constitute a full, true and correct extension of the notes taken in shorthand by me of the evidence in the trial of said cause; and I do further certify that at the time of taking said notes I was the Official Court Stenographer for the First Division of Alaska.

Dated at Juneau, Alaska, this 12th day of June, 1913.

R. E. ROBERTSON. [563]

And the plaintiff, to further maintain the issues on its part, offered in evidence the depositions of G. E. Quinn, W. J. Grambs and H. B. Dunn, which said depositions were received and read in evidence, and the statements of the witnesses therein received as evidence in the cause, which said depositions are in words and figures as follows, to wit: [564]

*In the District Court for the District of Alaska,
Division No. 1, at Juneau.*

No. 968—A.

ALASKA GASTINEAU MINING COMPANY, a
Corporation,

Plaintiff,

vs.

ALASKA TREADWELL GOLD MINING COMPANY, a Corporation, ALASKA UNITED GOLD MINING COMPANY, a Corporation, ALASKA MEXICAN GOLD MINING COMPANY, a Corporation, and ROBERT A. KINZIE,

Defendants.

Depositions.

The depositions of G. E. Quinan, W. J. Grambs and H. B. Dunn, of the county of King, State of Washington, witnesses of lawful age; produced, sworn and examined on their respective corporeal oaths, on the 17th day of February, in the year of our Lord, A. D. one thousand nine hundred thirteen, at Room 212, Pioneer Building, in the city of Seattle, in the county of King and State of Washington, be me, N. W. Bolster, a notary public in and for the State of Washington, residing at Seattle, pursuant to the stipulation hereunto annexed, directed to me for the examination of the said G. E. Quinn, W. J. Grambs and H. B. Dunn, witnesses in a certain suit and matter in controversy now pending and undetermined in the said District Court for the Territory of Alaska, Division No. 1, at Juneau, wherein Alaska Gastineau Mining Company, a corporation, is plaintiff and Alaska Treadwell Gold Mining Company, a corporation, Alaska United Gold Mining Company, a corporation, Alaska Mexican Gold Mining Company, a corporation, and Robert A. Kinzie, are defendants, in behalf of the said plaintiff, as well upon the cross-interrogatories of the defendants as on the interrogatories of the plaintiff which were attached to said

stipulation, and upon none others.

The said ———, being first duly sworn by [565] me as a witness to the said cause, previous to the commencement of his examination, to testify the truth, the whole truth, and nothing but the truth, as well on the part of the plaintiff as the defendants, in relation to the matters in controversy between the said plaintiff and defendants so far as he should be interrogated, testified and deposed as follows:

[Deposition of G. E. Quinan, for Plaintiff.]

Interrogatories to be propounded to the said G. E. QUINN, witness produced and sworn as aforesaid on the part of the said plaintiff, and his answers thereto as follows:

Interrogatory No. 1:

State your name, place of residence and occupation.

Answer to interrogatory No. 1:

George E. Quinn; Seattle; electrical engineer.

Interrogatory No. 2:

What is your present position with reference to your profession?

Answer to interrogatory No. 2:

Operating Superintendent of the Puget Sound Traction Light & Power Company, in Seattle.

Interrogatory No. 3:

State the experience you have had as an electrician or electrical engineer, giving in general the length of time of employment, positions employed in, and the experience involved in these employments. [566]

Answer to interrogatory No. 3:

After graduating from the University of Califor-

(Deposition of G. E. Quinan.)

nia with the degree of Electrical Engineer I entered the employ of the Washington Water Power Company in Spokane, worked for them as a switch-board wireman for several months and then I was sent by them into the Coeur d'Alene mining district, where I worked as a wireman on the installation of eight substations for supplying power to the mines in that district. On the completion of that work I went to Tacoma and entered the employ of the Electron for four months. I returned to Tacoma and was employed by the Tacoma Railway & Power Company in installing machinery for them, and in February, 1905, I took a position as assistant superintendent of power with the same company, remaining in that position until February, 1911, when I took the position which I now hold but which has since been changed to the Puget Sound Traction Light & Power Company. I have had experience in the installation of motors, generators, transformers, electric wiring, etc., and have also had considerable experience in calculations which were used as a basis for rate making both in Tacoma and Seattle. I have also had considerable experience in meter work. [567]

Interrogatory No. 4:

Attached to these interrogatories you will find a copy of the contract in controversy in this case which please read before answering further questions.

Answer to interrogatory No. 4:

I have read over the contract referred to.

Interrogatory No. 5:

How many of these units make an electrical horsepower?

(Deposition of G. E. Quinan.)

Answer to Interrogatory No. 5:

The watt.

Interrogatory No. 6:

How many of these units make an electrical horse-power?

Answer to interrogatory No. 6:

746 watts are equivalent to a horse-power.

Interrogatory No. 7:

What is the recognized practice and method with reference to measuring the delivery of electrical horse-power and what is the recognized machine for measuring current calling for the delivery of horse-power?

Answer to interrogatory No. 7:

The wattmeter is used almost universally for measuring power.

Interrogatory No. 8:

Where the use of a stated amount of horse-power is contemplated in a contract between parties, what is the common and ordinary acceptation of that term with reference to the [568] delivery of real or apparent power? State fully your knowledge and information upon this subject.

Answer to interrogatory No. 8:

In a contract calling for the delivery of a given number of horse-power there can be no other interpretation than that real power is meant. Contracts are sometimes drawn in which by special agreement between the parties to the contract the term "power" is, for the purposes of the contract, to be interpreted as meaning apparent power. Unless such agreement is specified in a contract, real power

(Deposition of G. E. Quinan.)

is always understood.

Interrogatory No. 9:

Where the use of a named amount of electrical horse-power is provided for without further definition in a power contract, state, if you know, what is the practice or common usage, of power companies with reference to permitting a surge or load whenever necessary so that this use may be enjoyed approximately to its full extent and so that machinery of the ordinary inductive case, such as Form K General Electric motors may be put in operation at approximately the amount of horse-power provided for in the contract.

Answer to interrogatory No. 9:

In my experience, and so far as I know, a starting surge lasting not to exceed half a minute is never construed by the company supplying the power as an excess use of power over and above [569] the amount contracted for, provided standard motors or apparatus are used. The General Electric Company's Form K motor is a standard motor and is widely used throughout this country.

Interrogatory No. 10:

By the use of ordinary care in a system of fair capacity, can such surges be taken with or without detriment to the general operation of the plant?

Answer to interrogatory No. 10:

In a generating plant of capacity equal to or greater than the rated capacity of the motors to which it is supplying power, the surges due to starting such motors, if they be of standard design, such

(Deposition of G. E. Quinan.)

as the General Electric Form K motor, and are not themselves overloaded should work no detriment to the power plant machinery.

Interrogatory No. 11:

Where a consumer's power line is directly connected with the switch-board and bus-bars of a producing plant, what is the general or ordinary practice with reference to the instalment of circuit-breakers so as to give a reasonable opportunity to use the power contracted for and yet give reasonable protection to the producing company against appreciable overloads which would throw the power consumption speaking from a practical standpoint above the amount contracted for. [570]

Answer to interrogatory No. 11:

A time limit relay controlling automatic switches would be installed on such a line, and the relay would be given a time setting sufficiently long to permit the starting of the consumer's motors, and a current setting somewhat above the normal current used by the consumer at full load.

Interrogatory No. 12:

What method can be adopted under the contract attached to these interrogatories to insure the delivery of an uninterrupted current of 300 horsepower and under common usage how should such power be measured, that is to say, with reference to the delivery of real or apparent power?

Answer to interrogatory No. 12:

A time limit relay controlling an automatic switch should be installed in the consumer's circuit. This

(Deposition of G. E. Quinan.)

relay should be given a time setting sufficiently long to permit of starting the consumer's motors and should be given a current setting somewhat higher than the consumer's full load current, that is to say, higher than his current corresponding to 300 electrical horse-power under full load running conditions of the motors. A curve drawing wattmeter should be installed in the consumer's circuit at the powerhouse, which will show at all times the real power which is being consumed. The power company will, therefore, be [571] able to determine at any time whether the consumer is using more power than the 300 horse-power to which he is entitled and can either arrange to bill the consumer for such excess power or take any other legal measures to insure the consumer living up to his part of the contract. It is not customary, and in fact I have never known a power company to install a circuit-breaker on the consumer for the purpose of interrupting his current, if the amount of power contracted for is exceeded.

Interrogatory No. 13:

Assuming a water-power plant with sufficient prime mover to operate a generator producing 300 horse-power, can a load of 300 horse-power be started from such plant or a load of 300 horse-power less line and transformer losses?

Answer to interrogatory No. 13:

Certainly. Furthermore, such a plant would be capable of starting a General Electric Form K motor whose load under full load running conditions was

(Deposition of G. E. Quinan.)

300 horse-power diminished of course, by line and transformer losses.

Interrogatory No. 14:

State what you know, if anything, about the usage in installing synchronous motors for the operation of compressor plants consuming approximately from 200 to 300 horse-power in mining operations. [572]

Answer to interrogatory No. 14.

I have known of synchronous motors being used in the operation of compressor plants of about 300 horse-power; in such cases the compressors were usually started light, that is the by-passes were opened so that the compressor in starting was running idle. After the motor reached full speed, or synchronism, the by-passes would be closed and the compressor be put under load.

Interrogatory No. 15:

Where a definite horse-power is called for in a power contract, what is the ordinary usage with reference to the measurement of that horse-power in terms of actual power or apparent power where the current is an alternating current and the motors are of an inductive type.

Answer to interrogatory No. 15:

When a contract calls for a definite number of horse-power, the ordinary usage is to measure the real power by means of a watt meter. In an alternating current system this is universally the practice, since the real power in an alternating current system depends not only upon the current and voltage, but also upon the power factor of the circuit. A watt-

(Deposition of G. E. Quinan.)

meter takes all of these factors into account and gives a record of the real power. [573]

Interrogatory No. 16:

Considering the conditions named in the preceding interrogatory, does the producer or consumer stand the loss involved in power factor where the load is an inductive load and the inductive motors are of the ordinary type and of reasonable efficiency?

Answer of interrogatory No. 16:

If a power company agrees to supply a given number of horse-power to a consumer without specifying in its agreement that some particular type of motor is to be used, it is a usual practice for the power company to permit the consumer to use any standard make of motor. The power which the customer consumes is measured by a wattmeter and is the real power and not the apparent power. The power company under these conditions expects to and of necessity must, furnish any excess amount of current which may be required in order to deliver the agreed amount of horse-power, such excess current being due to the power factor of the consumer's motor being less than unity. This means that the power company must have an excess capacity in machinery in order to carry out its contract.

Interrogatory No. 17:

What is the practice, if any, of power companies with reference to the installation of synchronous machinery at their own expense for the purpose of improving the power factor caused by inductive loads of consumers? [574]

(Deposition of G. E. Quinan.)

Answer to interrogatory No. 17:

It is common practice for power companies to install synchronous apparatus at their own expense at different points on a system for the purpose of improving the power factor due to consumers who are operating induction motors.

Interrogatory No. 18:

Under the conditions in the annexed contract, how would you ascertain the power factor of the consumer's circuit and set a circuit-breaker to insure the delivery of the power contracted for and yet provide ample protection to the producing company from overloads and for the drawing of more power than that contemplated in the contract?

Answer to interrogatory No. 18:

I would ascertain the power factor by having the consumer rate his motors and get them running at full load. I would then measure the current consumed, and if the voltage is kept constant at the power station, or reasonably constant, his power factor under full load running conditions would be expressed by the ratio of the real power consumed, which I would measure with a wattmeter, to the product of the volts and amperes as obtained above. To insure delivery of the power contracted for and still provide protection to the power company from overloads of greater duration than necessary to start consumer's machinery, I would [575] install a circuit-breaker in the consumer's circuit and set a relay controlling this circuit-breaker for a current somewhat in excess of the full load current as meas-

(Deposition of G. E. Quinan.)

ured above. I would give this relay a time setting sufficiently long to prevent the circuit-breaker opening during the time of starting consumer's motors, and if these motors are of standard make, such as General Electric Company's Form K motor, this period should not exceed from twenty-five to thirty seconds.

Interrogatory No. 19:

If the power factor of a circuit is determined at the point where the amount of power called for in the contract is being drawn and the circuit-breaker set in accordance therewith, general conditions remaining the same, would the lowering of the power factor involved in decreased probably change the setting of a circuit-breaker at the point determined in answer to your last question?

Answer to interrogatory No. 19:

No; because while the decreasing of the load on the motor will result in a decrease of its power factor, still the amount of current consumed by it will not exceed the current consumed under full load running conditions.

Interrogatory No. 20:

Conditions being kept approximately the same as at the time the power factor is determined, [576] is there any reasonable assumption that the power factor will so change that new or frequent settings for current delivery would become necessary?

SHACKLEFORD & BAYLESS,

Attorneys for Plaintiffs.

(Contract of October 14, 1909, attached.)

(Deposition of G. E. Quinan.)

CROSS-INTERROGATORIES AND ANSWERS
THERE TO BY THE WITNESS ON THE
PART OF THE DEFENSE.

Cross-interrogatory No. 1:

Are you familiar with the Electrical Engineer's Pocket-Book by Horatio A. Foster?

Answer to cross-interrogatory No. 1:

A. Yes, I am familiar with Foster's Engineer's Pocket-Book.

Cross-interrogatory No. 2:

Is it not a fact that a current of electricity is expressed by the formula $W = E \times I$, when I stands for amperes, E for volts and W for watts.

Answer to cross-interrogatory No. 2:

The formula $W = E \times I$, where W stands for watts E stands for volts and I stands for amperes, in an electrical circuit does not express the power in an alternating current circuit unless the power factor of that is unity. When induction apparatus, such as induction motors or transformers, are connected on an alternating current circuit the power factor is usually less than unity, and the above formula expresses [577] the apparent but not the real power of a single phase circuit. This formula does not express either the real or apparent power for a poly-phase circuit such as a three phase circuit.

Cross-interrogatory No. 3:

Is it not a fact that a watt is the unit of electrical power?

Answer to cross-interrogatory No. 3:

Yes.

(Deposition of G. E. Quinan.)

Cross-interrogatory No. 4:

Is it not a fact that 746 watts are equal to one electrical horse-power?

Answer to cross-interrogatory No. 4:

Yes.

Cross-interrogatory No. 5:

Are you not in the employ of the Stone-Webster corporation or one of their allied companies?

Answer to cross-interrogatory No. 5:

Yes.

Cross-interrogatory No. 6:

Is it not a fact that Mr. Shackleford is the attorney for the company by which you are employed?

Answer to cross-interrogatory No. 6:

Mr. Shackleford, the attorney for the plaintiff in this action, is not, to my knowledge, the attorney for any of the Stone-Webster Companies.

GEORGE E. QUINAN. [578]

State of Washington,

County of King,—ss.

I, N. W. Bolster, of the county of King, State of Washington, notary public in and for said State, residing at Seattle, do hereby certify, that previous to the commencement of the examination of the said G. E. Quinan as a witness in the suit between the said Alaska Gastineau Mining Company, plaintiff, and the said Alaska Treadwell Gold Mining Company, et al., defendants, he was duly sworn by me as such notary to testify the truth, the whole truth and nothing but the truth in relation to the matters in controversy between the said Alaska Gastineau Min-

ing Company, plaintiff and the said Alaska Treadwell Gold Mining Company, et al., defendants, so far as he should be interrogated concerning the same; that the said deposition was taken at Room 212, Pioneer Building in the City of Seattle, county of King and State of Washington, on the 17th day of February, 1913; and thereafter said deposition was taken by me as aforesaid, the interrogatories and answers thereto as written down, were read over to the said witness; and that thereupon the same was signed and sworn to by the said deponent before me, the oath being administered by me at the place, and on the day and year last aforesaid.

[Seal]

N. W. BOLSTER,

Notary Public in and for the State of Washington,
Residing at Seattle. [579]

[Deposition of W. J. Grambs, for Plaintiff.]

Interrogatories propounded to the said W. J. GRAMBS, whose name is written in said stipulation as W. J. Grumbs, a witness produced and sworn as aforesaid on the part of the said plaintiff and his answers thereto, as follows:

Interrogatory No. 1:

State your name, place of residence and occupation.

Answer to interrogatory No. 1:

W. J. Grambs; Seattle; superintendent of Light & Power for the Puget Sound Traction, Light & Power Company.

Interrogatory No. 2:

What is your present position with reference to

(Deposition of W. J. Grambs.)

your profession?

Answer to interrogatory No. 2:

Superintendent of Light & Power for the Puget Sound Traction Light & Power Company.

Interrogatory No. 3:

State the experience you have had as an electrician or electrical engineer, giving in general the length of time of employment, positions employed in, and the experience involved in these employments.

Answer to interrogatory No. 3:

Twenty-five years; first as agent of the old Edison Company at Seattle, and then with the General Electric Company and for the last thirteen years with the present company and its predecessors. Exploiting electrical industry.

Interrogatory No. 4:

Attached to these interrogatories you will find a copy of the contract in controversy in this case which please read before answering further questions.

Answer to interrogatory No. 4:

I have read and examined the contract referred to.
[580]

Interrogatory No. 5:

How many of these units make an electrical horsepower?

Answer to interrogatory No. 5:

The watt.

Interrogatory No. 6:

How many of these units made an electrical horsepower?

Answer to interrogatory No. 6:

(Deposition of W. J. Grambs.)

Interrogatory No. 7:

What is the recognized practice and method with reference to measuring the delivery of electrical horse-power and what is the recognized machine for measuring current calling for the delivery of horse-power?

the watt meter.

Interrogatory No. 8:

Where the use of a stated amount of horse-power is contemplated in a contract between parties, what is the common and ordinary acceptance of that term with reference to the delivery of a real or apparent power. State fully your knowledge and information upon this subject.

Answer to interrogatory No. 8:

To deliver real power this is the method that is used generally or universally.

Interrogatory No. 9:

Where the use of a named amount of electrical horse-power is provided for without further definition in a power contract, state, if you know, what is the practice or common usage of power companies with reference to permitting a surge or load whenever necessary so that this use may be enjoyed approximately to its full extent and so that machinery of the ordinary inductive [581] case, such as Form K, General Electric motors, may be put in operation at approximately the amount of horse-power provided for in the contract.

Answer to interrogatory No. 9:

It is customary to permit the use of a starting surge or load in excess above the capacity.

(Deposition of W. J. Grambs.)

Interrogatory No. 10:

By the use of ordinary care in a system of fair capacity, can such surges be taken with or without detriment to the general operation of the plant?

Answer to interrogatory No. 10:

Yes.

Interrogatory No. 11:

Where a customer's power line is directly connected with a switch-board and bust-bars of a producing plant, what is the feneral or ordinary practice with reference to the installment of circuit-breakers so as to give a reasonable opportunity to use the power contracted for and yet give reasonable protection to the producing company against appreciable overloads which would throw the power consumption speaking from a practical standpoint above the amount contracted for.

Answer to interrogatory No. 11:

Time limit relays are installed to permit more than 100 per cent greater current than the capacity of the motor.

Interrogatory No. 12:

What method can be adopted under the contract attached to these interrogatories to insure the delivery of an uninterrupted current of 300 horsepower and under common usage how should such power be measured, that is to say, with reference to the delivery or real or apparent power? [582]

Answer to interrogatory No. 12:

By means of wattmeter.

Interrogatory No. 13:

(Deposition of W. J. Grambs.)

Assuming a water-power plant with sufficient primer mover to operate a generator producing 300 horse-power, can a load of 300 horse-power be started from such plant or a load of 300 horse-power less line and transformer losses?

Answer to interrogatory No. 13:

It is doubtful. The generator ought to have at least 50 per cent greater capacity than the motor.

Interrogatory No. 14:

State what you know, if anything, about the usage in installing synchronous motors for the operation of compressor plants consuming approximately from 200 to 300 horse-power in mining operations.

Answer to interrogatory No. 14:

I do not know anything about compressor plants with synchronous motors.

Interrogatory No. 15:

Where a definite horse-power is called for in a power contract, what is the ordinary usage with reference to the measurement of that horse-power in terms of actual power or apparent power where the current is an alternating current and the motors are of an inductive type?

Answer to interrogatory No. 15:

By indicating wattmeters.

Interrogatory No. 16:

Considering the conditions named in the preceding interrogatory, does the producer or consumer stand the loss involved in power factor where the load is an inductive load and the inductive motors are of the ordinary type and of reasonable efficiency?

(Deposition of W. J. Grambs.)

Answer to interrogatory No. 16: [583]

The producer stand the loss unless there is a special agreement.

Interrogatory No. 17:

What is the practice, if any, of power companies with reference to the installation of synchronous machinery at their own expense for the purpose of improving the power factor caused by inductive loads of consumers.

Answer to interrogatory No. 17:

I never heard of it being done.

Interrogatory No. 18:

Under the conditions in the annexed contract, how would you ascertain the power factor of the consumer's circuit and set a circuit-breaker to insure the delivery of the power contracted for and yet provide ample protection to the producing company from overloads and for the drawing of more power than contemplated in the contract?

Answer to interrogatory No. 18:

You would estimate the power factor by means of the wattmeter and the installation of an ampere meter to determine the maximum current demand in order to set a circuit-breaker.

Interrogatory No. 19:

If the power factor of a circuit is determined at the point where the amount of power called for in the contract is being drawn and the circuit-breaker set in accordance therewith, general conditions remaining the same, would the lowering of the power factor involved in decreased probably change the set-

(Deposition of W. J. Grambs.)

ting of a circuit-breaker at the point determined in answer to your last question?

Answer to interrogatory No. 19:

No. [584]

Interrogatory No. 20:

Conditions being kept approximately the same as at the time the power factor is determined, is there any reasonable assumption that the power factor will so change that new or frequent settings for current delivery would become necessary?

Answer to interrogatory No. 20:

No.

CROSS-INTERROGATORIES AND ANSWERS
THERE TO BY THE WITNESS ON THE
PART OF THE DEFENSE.

Cross-interrogatory No. 1:

Are you familiar with the Electrical Engineer's Pocket Book by Horatio A. Foster?

Answer to cross-interrogatory No. 1:

Yes.

Cross-interrogatory No. 2:

Is it not a fact that a current of electricity is expressed by the formula $W = E \times I$ when I stands for amperes, E for volts and W for watts?

Answer to cross-interrogatory No. 2:

As I understand that question in regard to "current of electricity," $W = E \times I$, represents the apparent power in the line.

Cross-interrogatory No. 3:

Is it not a fact that a watt in the unit of electric power?

(Deposition of W. J. Grambs.)

Answer to cross-interrogatory No. 3:

Yes.

Cross-interrogatory No. 4:

Is it not a fact that 746 watts are equal to one electrical horse-power?

Answer to cross-interrogatory No. 4: [585]

Yes.

Cross-interrogatory No. 5:

Are you not in the employ of the Stone-Webster corporation or one of their allied companies?

Answer to cross-interrogatory No. 5:

Yes.

Cross-interrogatory No. 6:

Is it not a fact that Mr. Shackelford is the attorney for the company by which you are employed?

Answer to cross-interrogatory No. 6:

Not to my knowledge.

W. J. GRAMBS. [586]

State of Washington,
County of King,—ss.

I, N. W. Bolster, of the county of King, State of Washington, notary public in and for said State, residing at Seattle, do hereby certify, that previous to the commencement of the examination of the said W. J. Grambs, as a witness in the suit between the said Alaska Gastineau Mining Company, plaintiff, and the said Alaska Treadwell Gold Mining Company, et al., defendants, he was duly sworn by me as such notary to testify the truth, the whole truth and nothing but the truth in relation to the matters in controversy between the said Alaska Gastineau

Mining Company, plaintiff, and the said Alaska Treadwell Gold Mining Company et al., defendants, so far as he should be interrogated concerning the same; that the said deposition was taken at Room 212, Pioneer Building, in the City of Seattle, county of King and State of Washington, on the 17th day of February, 1913; and thereafter said deposition was taken by me as aforesaid, the interrogatories and answers thereto as written down, were read over to the said witness; and that thereupon the same was signed and sworn to by the said deponent before me, the oath being administered by me at the place, and on the day and year last aforesaid.

[Seal] N. W. BOLSTER,
Notary Public in and for the State of Washington,
Residing at Seattle. [587]

[Deposition of H. B. Dunn, for Plaintiff.]

Interrogatories Propounded to the Said H. B. DUNN, a Witness Produced and Sworn to Aforesaid on the Part of the Said Plaintiff and His Answers Thereto, as Follows:

Interrogatory No. 1:

State your name, place of residence and occupation.

Answer to interrogatory No. 1:

H. B. Dunn; occupation, contract agent for the Puget Sound Traction, Light & Power Company.

Interrogatory No. 2:

What is your present position with reference to your profession?

Answer to interrogatory No. 2:

(Deposition of H. B. Dunn.)

Contract agent for the Puget Sound Traction, Light & Power Company.

Interrogatory No. 3:

State the experience you have had as an electrician or electrical engineer, giving in general the length of time of employment, positions employed in, and the experience involved in these employments.

Answer to interrogatory No. 3:

None.

Interrogatory No. 4:

Attached to these interrogatories you will find a copy of the contract in controversy in this case which please read before answering further questions.

Answer to interrogatory No. 4:

I have examined the contract.

Interrogatory No. 5:

How many of these units make an electrical horse-power?

Answer to interrogatory No. 5:

The watt.

Interrogatory No. 6:

How many of these units made an electrical horse-power?

Answer to interrogatory No. 6: [588]

746.

Interrogatory No. 7:

What is the recognized practice and method with reference to measuring the delivery of electrical horse-power and what is the recognized machine for measuring current calling for the delivery of horse-power?

(Deposition of H. B. Dunn.)

Answer to interrogatory No. 7:

By wattmeters.

Interrogatory No. 8:

Where the use of a stated amount of horse-power is contemplated in a contract between parties, what is the common and ordinary acceptance of that term with reference to the delivery of a real or apparent power? State fully your knowledge and information upon this subject.

Answer to interrogatory No. 8:

Real power; I have been engaged in the business of selling electrical power for five years, and this has been my experience and it is universal, so far as I know.

Interrogatory No. 9:

Where the use of a named amount of electrical horse-power is provided for without further definition in a power contract, state, if you know, what is the practice or common usage of power companies with reference to permitting a surge or load whenever necessary so that this use may be enjoyed approximately to its full extent and so that machinery of the ordinary inductive case, such as Form K, General Electric Motors, may be put in operation at approximately the amount of horse-power provided for in the contract.

Answer to interrogatory No. 9:

In executing contracts it has been my custom to take [589] the rated capacity of motors as a total load and allow for a starting surge. I have never executed a contract where peaks of less than three

(Deposition of H. B. Dunn.)

minutes have been *taken* in consideration in determining the load.

Interrogatory No. 10:

By the use of ordinary care in a system of fair capacity, can such surges be taken with or without detriment to the general operation of the plant?

Answer to interrogatory No. 10:

Yes.

Interrogatory No. 11:

Where a consumer's power line is directly connected with the switch-board and bus-bars of a producing plant, what is the general or ordinary practice with reference to the installment of circuit-breakers so as to give a reasonable opportunity to use the power contracted for and yet give protection to the producing company against appreciable overloads which would throw the power consumption speaking from a practical standpoint above the amount contracted for.

Answer to interrogatory No. 11:

I could not answer this question as it belongs to the operating or engineering department.

Interrogatory No. 12:

What method can be adopted under the contract attached to these interrogatories to insure the delivery of an uninterrupted current of 300 horse-power and under common usage how should such power be measured, that is to say, with reference to the delivery of real or apparent power?

Answer to interrogatory No. 12:

I do not know what method would be adopted, but

(Deposition of H. B. Dunn.)

the power should be measured with reference to the delivery [590] of real power.

Interrogatory No. 13:

Assuming a water-power plant with sufficient primer mover to operate a generator producing 300 horse-power, can a load of 300 horse-power less line and transformer losses?

Answer to interrogatory No. 13:

I could not answer this question, as it belongs to the operating and engineering department.

Interrogatory No. 14:

State what you know, if anything, about the usage in installing synchronous motors for the operation of compressor plants consuming approximately from 200 to 300 horse-power in mining operations.

Answer to interrogatory No. 14:

I would make the same answer as to the previous interrogatory.

Interrogatory No. 15:

Where a definite horse-power is called for in a power-contract, what is the ordinary usage with reference to the measurement of that horse-power in terms of actual power or apparent power where the current is an alternating current and the motors are of an inductive type?

Answer to interrogatory No. 15:

I would make the same answer as to the previous interrogatory.

Interrogatory No. 16:

Considering the conditions named in the preceding interrogatory, does the producer or consumer stand the loss involved in power factor where the load is

(Deposition of H. B. Dunn.)

an inductive load and the inductive motors are of the ordinary type and of reasonable efficiency?

Answer to interrogatory No. 16: [591]

The producer—the company stand the loss.

Interrogatory No. 17:

What is the practice, if any, of power companies with reference to the installation of synchronous machinery at their own expense for the purpose of improving the power factor caused by inductive loads of consumers?

Answer to interrogatory No. 17:

It is customary for the producer—the company.

Interrogatory No. 18:

Under the conditions in the annexed contract, how would you ascertain the power factor of the consumer's circuit and set a circuit-breaker to insure the delivery of the power contracted for and yet provide ample protection to the producing company from overloads and for the drawing of more power than that contemplated in the contract?

Answer to interrogatory No. 18:

I would make the same answer as to interrogatory No. 11.

Interrogatory No. 19:

If the power factor of a circuit is determined at the point where the amount of power called for in the contract is being drawn and the circuit-breaker set in accordance therewith, general conditions remaining the same, would the lowering of the power factor involved in decreased probably change the setting of a circuit-breaker at the point determined in answer to your last question?

(Deposition of H. B. Dunn.)

Answer to interrogatory No. 19:

I would make the same answer as to previous interrogatory.

Interrogatory No. 20:

Conditions being kept approximately the same as at the time the power factor is determined, is there [592] any reasonable assumption that the power factor will soon change that new or frequent settings for current delivery would become necessary?

Answer to interrogatory No. 20:

I would make the same answer as to the previous interrogatory.

CROSS-INTERROGATORIES AND ANSWERS
THERE TO BY THE WITNESS ON THE
PART OF THE DEFENSE.

Cross-interrogatory No. 1:

Are familiar with the Electrical Engineer's Pocket-Book by Horatio A. Foster?

Answer to cross-interrogatory No. 1:

I have read Foster's Engineer's Pocket-Book.

Cross-interrogatory No. 2:

Is it not a fact that a current of electricity is expressed by the formula $W = E \times I$ when I stand for amperes, E for volts and W for watts?

Answer to cross-interrogatory No. 2:

I could not answer that question; it belongs to the operating or engineering department.

Cross-interrogatory No. 3:

Is it not a fact that a watt is the unit of electrical power?

Answer to cross-interrogatory No. 3:

Yes.

(Deposition of H. B. Dunn.)

Cross-interrogatory No. 4:

Is it not a fact that 746 watts are equal to one electrical horse-power?

Answer to cross-interrogatory No. 4:

Yes.

Cross-interrogatory No. 5:

Are you not in the employ of the Stone-Webster corporation or one of their allied companies? [593]

Answer to cross-interrogatory No. 5:

Yes.

Cross-interrogatory No. 6:

Is it not a fact that Mr. Shackelford is the attorney for the company by which you are employed?

Answer to cross-interrogatory No. 6:

Mr. Shackelford, the attorney for the plaintiff in this case is not, to my knowledge in the employ of the Stone & Webster corporation.

H. B. DUNN.

State of Washington,

County of King,—ss.

I, N. W. Bolster, of the county of King, State of Washington, notary public in and for said state, residing at Seattle, do hereby certify, that previous to the commencement of the examination of the said H. B. Dunn as a witness in the suit between the said Alaska Gastineau Mining Company, plaintiff, and the said Alaska Treadwell Gold Mining Company et al., defendants, he was duly sworn by me as such notary to testify the truth, the whole truth and nothing *by* the truth in relation to the matters in controversy between the said Alaska Gastineau Mining Company, plaintiff, and the said Alaska Treadwell

Gold Mining Company et al., defendants, so far as he should be interrogated concerning the same; that the said deposition was taken at Room 212, Pioneer Building in the city of Seattle, county of King and State of Washington, on the 17th day of February, 1913; and thereafter said deposition was taken by me as aforesaid, the interrogatories and answers thereto as written down, were read over to the said witness; and that thereupon the same was signed and sworn to by the said deponent before me, the oath being administered by me at the place, and on the day and year last aforesaid.

[Seal]

N. W. BOLSTER,

Notary Public in and for the State of Washington,
Residing at Seattle. [594]

And the defendants, to further maintain the issues on their part, offered in evidence the deposition of F. W. Bradley, the witness whose testimony was taken by deposition in the city of San Francisco and upon the stipulation attached to said deposition, and who testified on oath as narrated in said deposition, which said deposition of said F. W. Bradley so taken was received and read in evidence and the testimony of the said F. W. Bradley so given by deposition and received in evidence in this cause is as follows:
[595]

*In the District Court for the Territory of Alaska,
Division No. 1, at Juneau.*

Case No. 968-A.

ALASKA GASTINEAU MINING COMPANY, a
Corporation,

Plaintiff,

vs.

ALASKA TREADWELL GOLD MINING COM-
PANY, a Corporation, ALASKA UNITED
GOLD MINING COMPANY, a Corporation,
ALASKA MEXICAN GOLD MINING
COMPANY, a Corporation, and ROBERT A.
KINZIE,

Defendants.

Stipulation.

It is hereby stipulated that the deposition of F. W. Bradley may be taken in response to the hereunto attached interrogatories, both direct and cross, and that such deposition may be taken before P. J. Kennedy, a notary public in and for the State of California, or before any other notary public, without commission from the Court; and when the deposition shall have been so taken it shall be returned by such notary, to the Clerk of the District Court, at Juneau, Alaska, as provided by law, and may be read in evidence on the trial in this case, subject to such objections as might be made if the witness were personally present and testifying orally except that all objec-

tions as to the form of the question are hereby waived.

Dated this 30th day of January, 1913.

SHACKLEFORD & BAYLESS,
Z. R. CHENEY,

Attorneys for Plaintiff.

HELLENTHAL & HELLENTHAL,

Attorneys for Defendants. [596]

*In the District Court for the Territory of Alaska,
Division No. 1, at Juneau.*

Case No. 968-A.

ALASKA GASTINEAU MINING COMPANY, a
Corporation,

Plaintiff,

vs.

ALASKA TREADWELL GOLD MINING COM-
PANY, a Corporation, ALASKA UNITED
GOLD MINING COMPANY, a Corporation,
ALASKA MEXICAN GOLD MINING
COMPANY, a Corporation, and ROBERT A.
KINZIE,

Defendants.

**Interrogatories to be Propounded to F. W.
Bradley.**

Interrogatory No. 1:

What is your name and place of residence?

Interrogatory No. 2:

Do you know the Alaska Treadwell Gold Mining
Company, the Alaska United Gold Mining Company,
and the Alaska Mexican Gold Mining Company?

Interrogatory No. 3:

If you state that you are acquainted with these corporations, you may state what, if any, official position you occupy in relation to these corporations and each of them.

Interrogatory No. 4:

You may next state what official position you occupied in relation to these corporations in the years, 1909, 1910 and 1911.

Interrogatory No. 5:

Do you know Mr. L. P. Shackelford?

Interrogatory No. 6:

Do you know the Oxford Mining Company?

Interrogatory No. 7:

Do you know the International Trust Company?

Interrogatory No. 8:

Are you familiar with the mines at Sheep Creek, in connection with which a 30-stamp [597] mill was used prior to 1909?

Interrogatory No. 9:

Are you familiar with the contract made between the Oxford Mining Company on the one hand, and the three defendant corporations on the other hand, on the 14th day of October, 1909?

Interrogatory No. 10:

Do you know what facts lead up to the execution of this contract and what negotiations were had?

Interrogatory No. 11:

You may state in detail the negotiations had that lead up to the execution of the contract above referred to and read into your answer copies of all cor-

respondence had between the parties in relation to these negotiations.

Interrogatory No. 12:

Was it ever understood and agreed between the contracting parties that the Oxford Mining Company and its assigns were to be permitted to draw starting peaks, or starting currents where such peaks or starting currents were of more than 300 horse-power?

Interrogatory No. 13:

Was it ever understood by the contracting parties that a current of not to exceed 300 horse-power, provided for in said contract, should be a current from which 300 horse-power could be developed by means of motors or other appliances having a power factor of less than 100%. [598]

Interrogatory No. 19:

What, if anything, was ever said in connection with the negotiations leading up to the execution of this contract that could in anywise lead to the conclusion that the parties intended the current of not to exceed 300 horse-power to mean a current of not to exceed 300 horse-power factor at a power factor less than unity?

Interrogatory No. 15:

What is your profession?

Interrogatory No. 16:

If you answer the preceding interrogatory by stating that your profession is that of a mining engineer, you may state how much electric horse-power would be required to operate the Sheep Creek mines and the 30-stamp mill, that is to say, how much power would it require to operate this 30-stamp mill and furnish

ore for the same from the Sheep Creek mines, including all machines and apparatus necessary in connection with such operation.

Interrogatory No. 17:

In order to arrive at the intention of the parties at the time the above referred to contract was made, you may state what valuation, if any, was placed upon the current of not to exceed 300 electric horsepower, referred to in said contract, by the parties at the time said contract was made.

Interrogatory No. 18:

For the same purpose, you may state if you know what valuation is not being placed upon the current of not to exceed [599] 300 horse-power, provided for in said contract, by the plaintiff in this case.

Interrogatory No. 19:

You may state the sources from which you have derived your information with reference to the valuation now being placed upon said current by the plaintiff, and if such sources of information are in writing, you may read the same into your answer and attach a complete copy thereof to this deposition, marking the same as Exhibit "A."

Interrogatory No. 20:

Do you know Mr. H. L. Wallenburg?

Interrogatory No. 21:

Did you have a conversation with said H. L. Wallenburg in your office at San Francisco in the early part of the year 1912, in relation to the contract above referred to existing between the Oxford Mining Company, on the one hand, and the defendant Companies on the other?

Interrogatory No. 22:

If you answer the preceding interrogatory by stating that you had such a conversation, you may state as nearly as you can the date on which said conversation was had, the place at which it was had, and the persons present.

Interrogatory No. 23:

Q. Who, if anyone, did said Wallenburg claim to represent? [600]

Interrogatory No. 24:

If you state that you had such conversation, you may state of what such conversation consisted, giving the details thereof, as nearly as you can.

Interrogatory No. 25:

Had you ever informed the plaintiff Company, or any of its representatives, or conveyed to them any knowledge in relation to the construction that you placed upon the contract originally made between the Oxford Company and the defendant Companies above referred to?

Interrogatory No. 26:

If you state that you did convey to said plaintiff Company or its agents or officers or other persons connected therewith such knowledge or information, you may state to whom, when, where and in whose presence such knowledge or information was conveyed.

Interrogatory No. 27:

If such knowledge or information was conveyed either in whole or in part by means of writings, you may attach here such writings marking the same Exhibit "C" "C-1," "C-2," and so on, marking each

writing with the letter "C" and giving to each writing a separate number.

Interrogatory No. 28:

Are you familiar with the contract made between the Oxford Gold Mining Company on the one hand, and the defendant Corporations on the other hand, and relating to this same matter now under dispute, the contract referred to being the second [601] contract set up in the answer of the defendants herein, and bears date of the 22d day of April, 1911?

Interrogatory No. 29:

If you state that you are familiar with said contract, you may state what *lead* up to the execution of the same.

Interrogatory No. 30:

Are you familiar with that certain contract made between the Oxford Mining Company and the defendant Companies, in relation to the matters now under dispute, being the third contract set up in the defendant's answer, which said contract bears date of the 22d day of April, 1911?

Interrogatory No. 31:

State what the facts were that lead up to the execution of this contract and whether the same is still in full force and effect.

Interrogatory No. 32:

Have you in your possession or under your control the contract or lease between the Oxford Mining Company on the one hand and the defendant companies on the other, the contract or lease referred being the first contract set up in the defendant's an-

swer, and being the contract bearing date of October 14, 1909?

Interrogatory No. 33:

If you state that you have in your possession or under your control the original of the above referred to contract or lease kindly attach the same to this deposition and mark the same Exhibit "D." [602]

Interrogatory No. 34:

Have you in your control a certain contract made between the Oxford Mining Company on the one hand and the defendant companies on the other hand, bearing date of April 22, 1911, conveying to the defendant companies a certain rights at Sheep Creek, including certain water-rights, the contract or writing referred to being the second contract set up in defendant's answer.

Interrogatory No. 35:

If you have in your possession the contract or writing referred to in the preceding interrogatory kindly attach same to this deposition marking the same Exhibit "E."

Interrogatory No. 36:

Have you in your possession or under your control that certain contract made between the Oxford Mining Company on the one hand and the defendant companies on the other hand, bearing date of the 22d day of April, 1911, the contract referred to being the third contract referred to and set up in the defendant's answer, that is to say the contract referring to and having been made with reference to what is known as the Gilbert Contract.

Interrogatory No. 37:

If you answer the preceding interrogatory by stating that you have in your possession or under your control the original of the contract referred to in said interrogatory, kindly attach same to this deposition.
[603]

In the District Court for the District of Alaska, Division No. 1, at Juneau.

No. 968-A.

ALASKA GASTINEAU MINING COMPANY, a
Corporation,

Plaintiff,

vs.

ALASKA TREADWELL GOLD MINING COMPANY, a Corporation, ALASKA UNITED GOLD MINING COMPANY, a Corporation, ALASKA MEXICAN GOLD MINING COMPANY, a Corporation, and ROBERT A. KINZIE,

Defendants.

Cross-interrogatories to be Propounded to F. W. Bradley.

Cross-interrogatory No. 1:

State in terms of horse-power the capacity of the various machines which had been installed and used at and in connection with the Sheep Creek mines on and prior to the 14th day of October, 1909.

Cross-interrogatory No. 2:

Is it not a fact that one of the compressors which had been used in connection with the Sheep Creek mines prior to the 14th of October, 1909, was a compressor which is now in the possession of the Alaska

Juneau Gold Mining Company, of which you are the president and managing head, and is it not a fact that this compressor has been removed by you to the mouth of Snowslide Gulch and that the Alaska Juneau Gold Mining Company has ordered for that compressor a 200 horse-power induction motor?
[604]

Cross-interrogatory No. 3:

Is it not a fact that such 200 horse-power induction motors take a starting surge far in excess of 200 horse-power?

Cross-interrogatory No. 4:

Why did you not order a synchronous motor to operate your compressor at the mouth of Snowslide Gulch?

Cross-interrogatory No. 5:

In the month of August, 1909, you wrote a letter to Henry Endicott proposing the contract of October 14, 1909, between the Oxford Mining Company and the defendants in this case. Attach a copy of that letter and point out any suggestions therein contained with reference to your expectation that the Oxford Company or its successors would use any other than the ordinary type of induction motor.

Cross-interrogatory No. 6:

Point out in such letter any reference which you made at the time to your expecting that the Oxford Company or its successors should use a synchronous motor in connection with the operation of the contract.

Cross-interrogatory No. 7:

Is it not a fact that in the month of October, 1910,

after the attorney for the Oxford Company notified you that the Oxford Company would elect to take the horse-power provided for in the contract of October 14, 1909, that you offered to absorb that contract for [605] \$25,000.00 and the Oxford Company refused to sell the contract for \$25,000.00?

Cross-interrogatory No. 8:

Is it not a fact that in February, 1911, you offered to absorb the contract for \$25,000.00 and the Oxford Company's attorney refused to sell the contract for \$25,000.00?

Cross-interrogatory No. 9:

Is it not a fact that in October, 1909, immediately after the attorney for the Oxford Company notified you that they would elect to take the horse-power provided for in the contract of October 14, 1909, that you stated that horse-power was worth \$40.00 per annum and that Mr. H. H. Taylor, then president of the company, figured the contract to be worth \$150,000.00 on an 8% basis, that being the legal rate of interest in Alaska, but that at this conference you interrupted him and told him that the contract was not worth \$150,000.00 owing to your contention that the Oxford Company could not get the beneficial use of 300 horse-power under the contract because the contract did not provide for peak loads? [606]

Cross-interrogatory No. 10:

Is it not a fact that you and Mr. Kinzie have both contended since the Oxford Company elected to take the power that the contract was practically worthless and did not mean more than 100 horse-power because it would take 300 horse-power for a starting surge

under ordinary conditions?

Cross-interrogatory No. 11:

If you answer the last question in the affirmative, explain wherein you consider your letter to Henry Endicott of August, 1909, a fair and frank exposition of the meaning of the contract.

Cross-interrogatory No. 12:

At the time you had a conversation with H. L. Wollenberg in the year 1912, had you been informed that the Oxford Mining Company's property had been conveyed by that company to Wollenberg or any of his associates, or is it not a fact that you knew that the property was simply under option and that Wollenberg did not represent at that time the owners of the property?

Cross-interrogatory No. 13:

Is it not a fact that in July, 1912, you were not satisfied that Wollenberg, Thane or the plaintiff in this case were the owners of what was formerly the Oxford property and that [607] you demanded specific proof in July, 1912, to the effect that the contract in controversy in this case had been assigned to the plaintiff?

Cross-interrogatory No. 14:

If you know of any synchronous motors in use in the Juneau Mining District prior to October 14, 1909, state when they were located, their size and what use was made of the same.

Cross-interrogatory No. 15:

Is it not a fact that induction motors of the ordinary type were commonly in use upon mining loads of 300 horse-power or less?

Cross-interrogatory No. 16:

Why did you not use a synchronous motor upon your Alaska Juneau tunnel which you are driving from a point near the town of Juneau through to Woods Gulch?

Cross-interrogatory No. 17.

Attach to your deposition the contract between the Alaska Juneau Gold Mining Company and the defendants in this case for the sale and delivery of electric current from the defendants in this case to the said Alaska Juneau Gold Mining Company.

Cross-interrogatory No. 18:

Is the circuit-breaker upon the circuit between the defendant company and the Alaska Juneau Company set so that it will instantaneously go [608] out when the Alaska Juneau motors are being started?

Cross-interrogatory No. 19:

What does the Alaska Juneau Company pay to the defendant in this case for its starting surges and how are these starting surges measured?

Cross-interrogatory No. 20:

Speaking as an engineer, what is the money value, according to the rate charged the Alaska Juneau, of a starting surge of thirty seconds which will be required to start the Alaska Juneau's 300 horse-power motor at the mouth of Snow-slide Gulch?

Cross-interrogatory No. 21:

Why was a wattmeter ordered by the defendant companies to be placed upon the circuit of the plaintiff company?

Cross-interrogatory No. 22:

What has become of such wattmeter?

Cross-interrogatory No. 23:

What use did you expect to make of such watt-meter if you did not contemplate that your contract dealt with real and not apparent power?

Cross-interrogatory No. 24:

Annexed hereto you will find a copy of a letter purporting to have been written October 31, 1910, by you to Professor C. L. Corey. Examine the same and state whether the same is a substantial copy of said letter. [609]

Cross-interrogatory No. 25:

When you wrote this letter to Professor, why did you not send Professor Corey a copy of the contract of October 14, 1909, and a copy of your letter to Henry Endicott proposing the execution of the contract?

Cross-interrogatory No. 26:

Referring again to your letter of October 31, 1910, to Professor Corey, is it not true that at that time the Oxford Company claimed that the right to the 300 electric horse-power was of greater value than \$25,000.00?

Cross-interrogatory No. 27:

Point out any portion of that letter which shows that you construed the contract to deal with apparent instead of real power.

Cross-interrogatory No. 28:

Was this letter not written on or about the date when you objected to Mr. H. H. Taylor's paying \$150,000 to absorb the contract?

Attorneys for Plaintiff. [610]

(Copy.)

San Francisco, Cal., October 31, 1910.

Professor C. L. Cory,
Union Trust Building,
San Francisco.

My dear Professor:

The Alaska Treadwell and allied mining companies have leased a water power property to which they have added other property of their own and have since developed and equipped the whole with a generating plant and are now transmitting 2000 K. W. from this plant to their mines.

The lessor or owner of a portion of the water-power property interprets the lease as follows:

“That he has the option to either take 300 electric horse-power from and at our generating plant, or else to accept the sum of \$25,000.00 in complete payment for his property.”

The lessor construing the lease in this way, believes that the 300 electric horse-power from and at the generating plant is of greater value than the sum of \$25,000.00. Assuming that the lessor has the right to take 300 electric horse-power from and at the generating plant subject to all operating and physical conditions beyond our control, I wish your opinion as to the present cash value of the same under the following conditions:

First: The total cost of the above hydro-electric 2000 K. W. plant with electric power delivered at the mines seven to eight months per year has amounted to \$50 per horse-power.

Second: During the seven to eight months each

year there is more than sufficient water to run the plant to full capacity. During the remaining four to five months there will not be enough water to make the full 300 electric horse-power. That is, for at least four months each year, the plant may not [611] be able to average over 100 electric horse-power—that is a physical cause beyond our control.

Third: We have built a 2000 K. W. steam electric relay plant at a capital cost of \$50.00 per horse-power. With fuel oil delivered at 90¢ per barrel, we estimate that the total operating cost of this steam relay plant will not exceed \$35.00 per horse-power per year.

Fourth: We are developing another water-power which we own outright and will provide it with ample storage so as to have an all-the-year round power. The capital cost of this plant delivering electric power at the mines twelve months per year will be about \$135.00 per horse-power.

Fifth: We will still need power in addition to what the foregoing installations will provide, but can secure it by slightly increasing the capacity of any of the above-mentioned plants.

If the lessor is right in his contention that he can demand the 300 electric horse-power at the generating plant and sell it to the highest bidder, what price in your opinion would we be justified in offering him for it? You must consider that if this 300 electric horse-power is sold to any outsider, the outsider will have to build his own transmission line four miles to the nearest market, the power will only be good eight months per year and his peak loads cannot ex-

ceed 300 electric horse-power at the generating plant.

Yours very truly,

F. W. BRADLEY. [612]

In the District Court for the Territory of Alaska, Division No. 1, at Juneau.

Case No. 968-A.

ALASKA GASTINEAU MINING COMPANY, a
Corporation,

Plaintiff,

vs.

ALASKA TREADWELL GOLD MINING COMPANY (a Corporation), ALASKA UNITED GOLD MINING COMPANY (a Corporation), ALASKA MEXICAN GOLD MINING COMPANY (a Corporation), and
ROBERT A. KINZIE,

Defendants.

Deposition of F. W. Bradley [for Defendants].

BE IT REMEMBERED that pursuant to the stipulation of counsel for the respective parties in the above-entitled action attached hereto, together with the interrogatories, both direct and cross, also attached hereto, on the 24th day of February, 1913, in the City and County of San Francisco, State of California, before me, P. J. Kennedy, a Notary Public in and for the City and County of San Francisco, State of California, personally appeared F. W. Bradley, a witness produced on behalf of the defendants in the above-entitled action, now pending in said court, who being by me first duly sworn to testify to the truth, the whole truth, and nothing but

(Deposition of F. W. Bradley.)

the truth, in said cause, and to whom I propounded said interrogatories, both direct and cross, testified as follows: [613]

Answer to Direct Interrogatory No. 1:

F. W. Bradley, San Francisco, California.

Answer to Direct Interrogatory No. 2:

Yes, I am acquainted with these three corporations.

Answer to Direct Interrogatory No. 3:

I have been President of each of these three corporations since August 16th, 1911.

Answer to Direct Interrogatory No. 4:

In the years 1909, 1910 and 1911, prior to August 16th, 1911, I was Consulting Engineer for each of these three corporations and a number of their Boards of Directors.

Answer to Direct Interrogatory No. 5:

Yes, I have known Mr. L. P. Shackleford for a number of years.

Answer to Direct Interrogatory No. 6:

I know the Oxford Mining Company through the three different contracts the defendant corporations in this action have made with it.

Answer to Direct Interrogatory No. 7:

I know the International Trust Company through transactions pertaining to Sheep Creek and Silver Bow Basin water rights and properties.

Answer to Direct Interrogatory No. 8:

Yes, I am familiar with the mines in Sheep Creek with which a 30-stamp mill was used prior to 1909.

[614]

(Deposition of F. W. Bradley.)

Answer to Direct Interrogatory No. 9:

Yes, I am familiar with said contract of October 14th, 1909.

Answer to Direct Interrogatory No. 10:

Yes, I know the facts and was a party to all the negotiations leading up to the execution of this contract.

Answer to Direct Interrogatory No. 11:

While at Treadwell during the summer of 1909, I talked, on behalf of the defendant corporations herein, to L. P. Shackleford, who at the time was attorney for the defendant corporations in this action, as well as the attorney for the International Trust Company, regarding buying the Trust Company's properties and water right on Sheep Creek, which consisted of the following:

The Mexico Millsite, the Belvidere Millsite and Jumbo Millsite—all three of these millsites being so patented as to cover the mouth of Sheep Creek where it empties into Gastineau Channel; also a certain one-quarter ($\frac{1}{4}$) acre tract adjoining the Jumbo Millsites on the west and certain premises still further west occupied and used for a wharfsite; also a water right on Sheep Creek that had previously been developed so as to utilize the water under a head of about 240 feet in an old direct current electric and compressed air power-house located on the Mexico millsite, together with the flume and the pipe-line and all the machinery in the power-house; also the saw-mill, boarding-house, lumber sheds, and all other machinery and appliances, tools, equipment, plants, etc., then

(Deposition of F. W. Bradley.)

upon the property.

I did not consider the then old disused and dilapidated electric and compressed air power plant as of much value, but did value the patented millsites along the beach as they controlled the best site for a new power house. I considered that the [615] water flowing in Sheep Creek would belong to whoever appropriated and utilized it; but I did not want any trouble with our neighbors so negotiated the contract of October 14th, 1909, in which Mr. Shackelford, as representing the International Trust Company, and myself, as representing the defendant corporations in this action, had mutually agreed upon \$25,000 as the value of all the foregoing described property, consisted of patented millsites with two other tracts of land, with wharf and wharfsite together with a power-house and other buildings, other plants, machinery and pipe-lines and the then developed water-power.

After coming to this agreement as to the value of all the foregoing property, it was then considered that to sell this water right would leave the Sheep Creek 30 stamp mill and mines without their water-power, and it would consequently be difficult to sell them. This water-power was considered an inducement for securing a purchaser for the mines, such as the general inducements of timber, water, ample dump room, etc., that are always held out in order to sell a mining property of doubtful intrinsic worth. Therefore, the essence of the negotiation was the water itself, sufficient power from which was to be

(Deposition of F. W. Bradley.)

reserved for any future working of the Sheep Creek 30 stamp mill and mines.

Believing that the contract would be used for the purpose of making a sale of the Sheep Creek Mines, I wanted it to show on its face that the current could not be delivered at such times as the flow of water in Sheep Creek would be insufficient to generate it. The operators of the old power plant on the Mexico millsite must have known full well the fact, for it is a fact, that during the winter months of each year there was not sufficient water in Sheep Creek to operate that plant to anywhere near capacity, if at all. Mr. Shackelford did not want this fact to show in the contract, so in its place was submitted a release [616] from all operating and physical causes beyond our control to provide for a shortage of water and necessary losses in the transmission and use of the power, as well as other contingencies.

In following the matter up, I wrote on August 10th, 1909, to Henry Endicott, of Boston, the following letter:

Treadwell, Alaska, August 10, 1909.

Henry Endicott, Esq.,

101 Tremont Street,

Boston, Mass.

Dear Sir:—

We have been talking to Mr. L. P. Shackelford about your water right on Sheep Creek, this district, and both he and ourselves have agreed upon what we consider an extremely fair proposition. Our conclusions have been drawn up in the shape of a docu-

(Deposition of F. W. Bradley.)

ment which Mr. Shackelford will present to you.

As it is now, this Sheep Creek water power is in jeopardy and can be taken at any time by adverse interests. Our proposed arrangement will preserve your rights while at the same time developing them and making the most use of them. I presume you are holding this water right for the value that it has had and may have in the future for working the Sheep Creek mines and 30 stamp mill connected therewith. Estimating conservatively, 150 H. P. is all the power these mines and mill ever required for their past operations. The mill is amply large enough for the mine and surely 200 H. P will more than take care of future requirements.

If the proposition is at all acceptable to you, we would begin immediate work, thereby preserving your rights and returning you some monthly income. The proposition provides ample time in which you could decide either to sell the property outright or take 200 H. P. for the operation of the mines and [617] mill.

Yours very truly,

F. W. BRADLEY.

To this Mr. Endicott made the following reply on August 23, 1909:

101 Tremont St., Boston,
August 23, 1909.

F. W. Bradley, Esq.,
Wardner, Idaho.

Dear Sir:—

I have received through Mr. Shackelford your letter of the 10th inst.

(Deposition of F. W. Bradley.)

After talking with persons who represent a majority interest in bonds of the American Gold Mining Co., I telegraphed you to-day:

“Will lease power on terms proposed subject to consent of Trust Co. if three hundred horse power is substituted for two hundred.”
which I now confirm.

Yours very truly,

HENRY ENDICOTT.

CONSIDERING the suggestion for an extra 100 horse-power as creating a total margin of 150 horse-power over and above the 150 horse-power necessary to operate the 30 stamp mill and Sheep Creek mines, I replied favorably, as per telegram contained in following letter of August 28th, 1909, to R. A. Kinzie: (Copy of this letter was sent to Henry Endicott and another copy to L. P. Shackleford.)

Kellogg, Idaho, Aug. 28, 1909.

R. A. Kinzie, Esq.,
Treadwell,
Alaska.

Dear Sir:—

While in Spokane on the 25th inst., I received following [618] telegram from Mr. Henry Endicott:

“Will lease power on terms proposed subject to consent Trust Company if three hundred horse power is substituted for two hundred.”
to which I wired following reply:

“You may substitute three hundred for two hundred horse power. May I cable Supt. Kinzie to begin immediate protective measures.”

(Deposition of F. W. Bradley.)

On same day I had reply from Mr. Shackelford, at Boston, as follows:

“Wire Kinzie proceed. President Trust Co. Europe. Sure will confirm on return. Majority Bondholders will take formal action then.”

I, therefore, cabled you:

“Sheep Creek deal practically closed. Begin immediately complete protective measures.”

You will understand that this refers to the making of the necessary quartz locations so that the Sheep Creek water may be utilized under the highest head possible instead of under the very low head under which the present pipe line taps the creek. Write me fully just what you have done in this connection.

Yours very truly,

F. W. BRADLEY.

Copy Henry Endicott,
101 Tremont St.,
Boston, Mass.

Copy H. H. Taylor,
Mills Building,
San Francisco, Cal.

Copy L. P. Shackelford,
Juneau, Alaska.

No question whatever had been nor could be raised as to my statement that 150 horse-power was all the Sheep Creek mines and 30 stamp mill had ever required for their past operations and that the mill was amply large enough for the mines, for this was the fact known to all parties concerned. [619]

(Deposition of F. W. Bradley.)

October 13th, 1909, I wrote R. A. Kinzie the following letter, copy of which was sent to L. P. Shackelford:

San Francisco, Cal., Oct. 13, 1909.

R. A. Kinzie, Esq.,
Treadwell City,
Alaska.

Dear Sir:—

I am cabling you to-day, in cipher, the following:

“Tell Shackelford am writing him to-day Sheep Creep giving Malony copy letter. Malony leaving to-night Juneau. Letter suggests combination save litigation, Sutherland’s option Malony rights expired. Malony offers them to us but in view Shackelford’s negotiations have put Malony off with above letter. Have not told Malony any details Shackelford’s negotiations Trust Company our behalf.”

I herewith hand you copy of the letter referred to. Having nothing definite from Mr. Shackelford as to his negotiations in our behalf with the International Trust Company of Boston, I was in no position to turn Malony down. At the same time we do not want to lose the chance of acquiring Malony’s rights in case we do nothing with the International Trust Company. He has a perfect scheme there with his water locations and beach claims that would give us free use of flood water without any dealings of any kind with the International Trust Company. Malony realizes that we had a perfect right to make our locations on Sheep Creek and must realize that he is

(Deposition of F. W. Bradley.)

powerless to do himself any good financially in case we make the contemplated agreement with the International Trust Company.

As I understand the litigation, Malony can, of course, begin some litigation and embarrass us. As he is out but \$1600 on his water right claims, etc., we could well afford to reimburse him rather than have any litigation. If enough power is held out of our contemplated plant to provide for the operation of the Sheep Creek mines, this would, I think, satisfy Malony as well as the International Trust Company. While I have made this suggestion [620] to Malony, I have not told him at all that this is the essence of our negotiations with the International Trust Company.

Please write me what you are doing about developing and equipping our water right locations on Sheep Creek.

Yours very truly,

F. W. BRADLEY.

1 enc.

Copy to:

L. P. Shackelford, Esq.,
Juneau, Alaska.

The essence of the foregoing letter was that by buying Mr. Malony's water right and industrial site, we could have taken the water power away from the International Trust Company. In this letter I stated that the essence of our negotiations with the International Trust Company was to hold enough power out of our then contemplated plant to provide for the

(Deposition of F. W. Bradley.)

operation of the Sheep Creek Mines, meaning the 30 stamp mill Sheep Creek Mines. This same idea was repeated in my letter of October 13th, 1909, to L. P. Shackelford, as follows:

San Francisco, Cal., Oct. 13, 1909.

L. P. Shackelford, Esq.,

Juneau, Alaska.

Dear Sir:—

On the 11th inst. I wired you, care of the Pacific Coast Steamship Co., at Seattle, as follows:

“Wire if you can come here immediately fix up some combination with Malony regarding Sheep Creek.”

Last night I had a reply from the Pacific Coast Steamship Co. saying that they were informed that you were en route to Juneau.

I wired you as above thinking that if the three of us [621] got together we could fix up some arrangement regarding the Sheep creek water power that would enable the Douglas Island Mining Companies to equip and utilize their claims to the water-power without any controversies.

Mr. J. F. Malony has approached me in this matter in a very fair attitude and I hope that some combination can be arranged that will be mutually satisfactory. I understand from him that he has made certain locations on the creek and on the beach with a view of utilizing this power and has expended some \$1,600.00 in this connection.

As I understand the situation, the International Trust Company values whatever right it may have to

(Deposition of F. W. Bradley.)

the water for the purpose of adding value to the Sheep Creek Mines. Mr. Malony also values his claim to the water because of his interest in the mortgages on the Sheep Creek Mines which has cost him some \$14,600.00 plus due and accruing interest. I have told him in a general way about our negotiations and have suggested to him that his ideas and the ideas of the International Trust Company as to the value of the water power for the Sheep Creek Mines might be preserved by allowing a certain amount of the power to be generated by the Douglas Island mining companies on Sheep Creek to be subject to the call of the Sheep Creek Mines for the purpose of their operations. In view of all the conditions and circumstances, I think it possible to work out some plan whereby all interests would be protected or compensated and the mining companies enabled to equip and use their water power claims without any controversies.

Yours truly,

F. W. BRADLEY.

Copy to J. F. Malony.

“ “ R. A. Kinzie. [622]

We did eventually buy the Malony right so as to save having any conflict or trouble at all. Regarding these negotiations, Mr. Shackleford wrote me October 18, 1909, as follows:

(Deposition of F. W. Bradley.)

Juneau, Alaska, Oct. 18, 1909.

F. W. Bradley, Esq.,
San Francisco, Cal.

Dear Sir:—

Mr. Graham, President of the International Trust Company, was absent in Europe upon my arrival in Boston, and it was not until the latter part of September that I was able to get his attention and consent to the necessary arrangements so that the lease agreed upon between you, representing the Treadwell and other companies, and Mr. Endicott, representing the majority of the bondholders, could be consummated. The Trust Company has executed a deed of all the property foreclosed by it in 1902 to a Maine corporation; the name of the corporation had not been settled upon when I left Boston. The corporation has since been organized and all of the papers, including the lease and the consent of the Trust Company to the transfer of the property and to the lease have been executed and were mailed from Portsmouth, New Hampshire, on the fourteenth of this month. As soon as they reach here I will forward the original leases to your companies for execution. I regret that the matter was so much delayed, but it could not be done in a legal and regular form until the Trust Company formally acted upon the proposition.

I received your telegram concerning a letter written of which Mr. Malony has a copy. Mr. Kinzie gave me a copy of the telegram on my arrival, night before last. I take it that Mr. Malony has asked you

(Deposition of F. W. Bradley.)

to purchase his so-called water right on Sheep Creek, together with the mortgages owned by him and Behrends upon the property covered by the Southerland option. [623] Perhaps he has also offered to sell you Sutherland's title. I doubt whether he will obtain Sutherland's consent to this unless you expend something in the neighborhood of \$100,000.

While I was east, I saw Mr. Gilbert of the Perseverance Company, and offered, on behalf of the bondholders, to quitclaim all of the property of the American Company in the Basin subject to the lien of the Trust Company and myself for expenses, amounting to some \$31,000, if he would deed to the bondholders the property which Fred Howell attempted to sell to Sutherland, and that the bondholders would then fight out the question of the validity of the \$33,000 worth of mortgages which it was claimed were valid liens on the Sheep Creek Mine. Mr. Gilbert said that Colonel Sutherland would probably let me know whether they could accept this proposition about the middle of November. In this way our people could gain possession of the mine and head of the falls, and there would be little difficulty in arranging so that you could push your plant on up there. Malony is not entitled to possession of the ground, and if I can get Sutherland to stand with us, I think I will be able to recover the Sheep Creek Mine, and the bondholders will be willing to put the whole creek at your disposal for a sum much less than any that will be demanded of you by Malony.

Of course, if this trade is made, the Sutherland

(Deposition of F. W. Bradley.)

people will naturally expect to make use of the Granite Creek water right, and while there is a clause in the Master's deed to the Aurora claim which gives you the right to use the water after the Trust Company or its assigns are through using it on the Basin mines, I do not think the clause gives you very much protection. In addition to this, the Granite Creek water right would lapse unless you expended a very large amount of money thereon. I told Mr. Gilbert that we would either have to [624] get Sheep Creek back by trading the Basin for Sheep Creek, or we would feel inclined to offer all of the Basin property to the Alaska Juneau for a stock interest in the Alaska Juneau. We do not care to hold on to the Basin property at this time. The expense of preserving the rights there is more than the recompense. If you can wait, before doing business with Malony, until after I hear from Sutherland, I believe we can get Sheep Creek in such shape that there will be no difficulty about your getting physical possession of any part of the creek that is necessary for pipe lines, flumes, and other necessary structures.

Yours truly,

LEWIS P. SHACKELFORD.

October 19, 1909, he also wrote me as follows:

Juneau, Alaska, October 19, 1909.

F. W. Bradley, Esq.,

Crocker Bldg.,

San Francisco, California.

Dear Sir:—

I received this morning by mail, from the Pacific

(Deposition of F. W. Bradley.)

Coast S. S. Co., in Seattle, the original of your telegram of October 11th, also, your confirmation of the same telegram. I left Seattle on the night of the 11th, but the telegram was not delivered to me. Of course, you know if I had received it, I would have answered the same promptly. It makes little difference, however, as I have been away from Alaska so long it was absolutely necessary for me to return here immediately. I rather take it from your telegram to Mr. Kinzie about the Malony situation that Malony expects to come here immediately. As soon as he arrives here, I will see whether it is more [625] advantageous to deal with him or to allow us to deal with Sutherland. I am rather inclined to think that Gilbert is very much put out with Malony and probably Sutherland too. They seem to feel that they have been fighting Malony's battles rather than their own for the last two years and that he owed it to them not to press the Sheep Creek mortgages and his bill for services at this time.

I was very glad to learn from Mr. Kinzie that he had been able to survey a flume line which did not pass through any of the mill sites in controversy between Sutherland and the Boston people. I do not see what can prevent the successful diversion of the water if you push ahead so as to beat any other person to the diversion.

Governor Hoggatt is on his way to San Francisco and will call on you. He has all of the Alaska news. The President has at last made up his mind to the situation here and his view is sound and sensible.

(Deposition of F. W. Bradley.)

He is heartily in accord with Hoggart and Clark, and I am satisfied Clark will receive the unqualified support of the administration as long as he desires to remain in office. He certainly has no demagogic illusions about the conditions up here and as long as Governor Hoggart could not see his way clear to become a candidate for another term, I am satisfied that we have the best man possible for his place.

My present program, if possible, is to see if I can not get Sutherland and Gilbert divorced from the influences of Malony, Mitchell and Valentine. Malony has given us an opening to do this by suing Sutherland. I do not care for an answer to this inquiry from you, but I wish you would write Mr. Kinzie to state frankly to me whether there is any objection to making peace with the Perseverance crowd, if Gilbert and Sutherland are willing to take the right stand on the labor question. Most of [626] Sutherland's litigation will be forced to trial in December, when Judge Overfield arrives here. Judge Cushman being disqualified to try any of the Perseverance cases, and the Perseverance people are somewhat in confusion and in a quandry as to what is the best thing to do. If there will ever be a time in which I can reach an understanding with them, it will be within the next month and a half. If Malony continues to press Sutherland and Gilbert, I think that I will be able to arrange a conference between Gilbert, Sutherland and yourself. It looks to me as if Gilbert were in this frame of mind at the present time. Whether Sutherland has sense enough to feel the same way, I do not know.

(Deposition of F. W. Bradley.)

If he has not, I am afraid he will be able to dominate Gilbert as Gilbert is rather a timid man. Any peace that Malony may patch up with reference to Sheep Creek will be on a business basis largely in his own interest, and I do not think it will insure any better state of feelings in the future between your people and the Perseverance.

Yours very truly,

LEWIS P. SHACKELFORD.

October 30th, 1909, L. P. Shackelford wrote me as follows, handing me the contract of October 14th, 1909, as executed by Oxford Mining Company:

Juneau, Alaska, Oct. 30, 1909.

F. W. Bradley, Esq.,

Crocker Bldg.,

San Francisco, California.

Dear Sir:

Herewith enclosed you will please find three leases, executed in triplicate, of the property described in the form of lease adopted by Mr. Taylor and yourself in your negotiation with the bondholders under the mortgages from the Nowell Gold Mining Company to the International Trust Company. The lease [627] is in the exact form proposed by you and Mr. Taylor, except that the horse-power has been increased from two hundred to three hundred in accordance with your telegraphic negotiations with Mr. Endicott.

I enclose herewith also for your information a copy of the deed from the International Trust Company to the Oxford Mining Company, a Maine Cor-

(Deposition of F. W. Bradley.)

poration, of the property foreclosed by the Trust Company in the years 1902 and 1903.

The lease to you of the water right and appurtenant property is from the Oxford Mining Company. Attached to the lease is a consent of the International Trust Company, which was necessary because it had reserved a lien upon all the property it had foreclosed, in the sum of \$34,000, to reimburse the Trust Company for its fees and expenses. Attached also to two of these originals is an assignment of the rentals to become due under the lease in favor of the Trust Company. As soon as you execute the lease from the Oxford Mining Company to the Treadwell, the Alaska United and the Alaska Mexican Companies, and attach to the lease the proper form of acknowledgments, and send me a certified copy of the resolutions of the United, Treadwell and Mexican companies adopting and approving the lease and authorizing its execution, I will record the deed from the Trust Company to the Oxford Mining Company and the lease of the Oxford Mining Company to the Treadwell, Mexican and United Companies. This will complete the transaction at the present time.

Mr. Maloney has this day offered to sell me the mortgages of Behrends, Malony & Cobb and himself on the Sheep Creek properties, amounting with interest at the present date to some \$38,000 for \$19,000. I am to advance within ten days \$1,200 so that the assessment work upon the property may be done by the mortgagees, and I have the option of paying the remaining amount [628] on the purchase price on or before the 10th day of January, 1910.

(Deposition of F. W. Bradley.)

He has reserved his water right for the purpose of selling the same to you, as I understand it, and it may be that you have reached some terms by this time. I do not think that there will be any necessity for paying him any large amount for his water right, if any at all. I do not think that the water right amounts to anything. I hope that the eastern people will take up the option and purchase these mortgages for they will then have the Sheep Creek unless Sutherland advances about \$40,000 to pay the mortgages off. I have a curiosity to know what, if any, arrangements you make with Malony and hope you will advise me.

Yours very truly,

LEWIS P. SHACKELFORD.

P. S. Please return 2 copies of lease, keep one.

This completes as far as I can recall or can find at the present time all the correspondence between the parties in relation to these negotiations, leading up to the execution of the contract.

Answer to Direct Interrogatory No. 12:

No, it was never understood nor agreed nor contemplated between the contracting parties that the Oxford Mining Company was to be permitted to have starting peaks or currents of more than three hundred horse-power.

The essence of the contract was Sheep Creek water and the Oxford company was to have sufficient of the first flow to make 300 electric horse-power but not one horse-power more as the balance of the water was to be for our sole use. Peaks in excess of 300 horse-power could be so large as to require all the

(Deposition of F. W. Bradley.)

water in Sheep Creek for their generation. [629]

When the contract was first discussed between Mr. Shackleford and myself, I wanted to limit the use of the power directly to the 30 stamp mill and Sheep Creek Mines, as proposed in my letter of August 10th, 1909, to Henry Endicott; but Mr. Shackleford objected to such a limitation. So not knowing what the power might be used for or where, if the option were exercised to take it, I insisted on limiting it to "A CURRENT OF NOT TO EXCEED 300 ELECTRIC HORSE-POWER FROM AND AT THE GENERATING PLANT." That is, a strict limitation to the quantity of water that would make a current of 300 electric horse-power.

Answer to Direct Interrogatory No. 13:

No, it was never understood between the contracting parties that a current of not to exceed 300 electric horse-power should be a current from which 300 horse-power could be developed by means of motors or other appliances having a power factor of less than 100 per cent. Such practice would result in using up much more of the water in Sheep Creek than required to make 300 electric horse-power, and could be so abused as to use up the entire flow of Sheep Creek for more than eight months of each year.

I had made a liberal estimate that 150 horse-power was ample for all the power requirements of the 30 stamp-mill and Sheep Creek Mines and that a margin of 50 horse-power would be sufficient to take care of all contingencies, such as transmission losses

(Deposition of F. W. Bradley.)

and starting peaks. One of the questions between Mr. Shackleford and myself in negotiating the contract was as to the place and the use of the power. I wanted to limit it strictly to the place and use of the 30 stamp-mill and Sheep Creek Mines in accordance with my letter of August 10th, 1909, to Henry Endicott. Mr. Shackleford insisted that this limitation be omitted. As there had to be some limitation, I had it expressly stipulated that [630] the amount of current from and at the generating plant should not exceed 200 electric horse-power and afterwards consented to the addition of an extra 100 horse-power as good measure to provide a maximum limitation of twice the power required to operate the 30 stamp-mill and Sheep Creek Mines.

I believe, at the time, that a 200 or 300 horse-power limitation would easily yield 150 net horse-power but that a poor transmission line and inefficient electrical machinery and apparatus could absorb so much of the power so as to leave a very little for useful work. Therefore, I insisted on my limitation so that our duty would be clear and specific in delivering a certain maximum portion of the output of the plant at a certain definite place. In other words, a current of not to exceed 300 electric horse-power from and at the generating plant.

Answer to Direct Interrogatory No. 14:

Nothing was ever said leading up to the execution of this contract to lead to the conclusion that the parties intended the current of not to exceed 300 electric horse-power to mean a current of not to ex-

(Deposition of F. W. Bradley.)

ceed 300 electric horse-power at a power factor less than unity. To use the 300 horse-power at a power factor less than unity would consume correspondingly more of the water of Sheep Creek than necessary to generate a current of 300 electric horse-power.

Answer to Direct Interrogatory No. 15:

Mining Engineer.

Answer to Direct Interrogatory No. 16:

To operate the 30 stamp mill with lights, rock crusher and vanners would require 74 horse-power, and to operate an air-compressor for the machine drills necessary to keep this mill supplied with ore would require 75 horse-power; or a total of [631] 150 horse-power. The moving of the ore from the mine to the mill was by means of steam locomotives of 5 to 10 horse-power over a narrow gauge railroad track and it was never contemplated that this haulage equipment would be changed. There was much old and discarded machinery about the place but none of it was necessary for keeping the 30 stamp-mill in operation.

Answer to Direct Interrogatory No. 17:

The intent of the parties always went back to the water itself, and a valuation of the current of not to exceed 300 electric horse-power would be a valuation of the water right; but there was no detailed valuation placed on the water right alone. This was considered to be in jeopardy because of nonusage; but a total valuation of \$25,000 was agreed on between Mr. Shackelford and myself as the value of either the current of not to exceed 300 electric horse-

(Deposition of F. W. Bradley.)

power, or of the water right, together with the patented millsites, certain other tracts of land, the wharfsite and wharf, the power-house and other buildings, the flume, water pipe-line, air pipe-line, transmission line, machinery, apparatus, and tools of every kind.

Answer to Direct Interrogatory No. 18:

Assuming that this question names the valuation placed by the predecessors of the plaintiff herein upon the current of not to exceed 300 electric horse-power, I have to answer \$130,000, \$150,000, and \$250,000.

Answer to Direct Interrogatory No. 19:

The valuation of \$150,000 is the price at which the Oxford Mining Company optioned the contract to W. P. Hammon of this city, as verbally reported to me by L. P. Shackleford. The valuation of \$250,000 and \$130,000 is derived from copy of B. L. Thane's statement of June 12, 1911, paragraph C. page 11, [632] as per copy handed me by L. P. Shackleford. This paragraph also states that 300 electric horse-power will run the Perseverance 100 stamp-mill, and besides furnish power to drive the Gastineau Tunnel. Attached is a copy of this statement marked "EXHIBIT A."

Paragraph "C," page 11, is as follows:

"(c) 300 DEVELOPED ELECTRIC HORSE-POWER: WE CONTROL 300 Developed Electric Horse-power, situated at Sheep Creek and now in operation to be taken from

(Deposition of F. W. Bradley.)

lines without cost, capable of running throughout the year present 100 stamp-mill, and furnish power to drive Gastineau Tunnel. The value to the property, easy,.....\$250,000. Earning capacity at present time at rate of \$40 per H. P. per year, \$12,000 per annum. We have offers for this power at the present time from outside concerns. This property has a cash value of.....\$130,000.”

According to above quotation and without taking into consideration that the Perseverance stamps referred to are much heavier than the light stamps in the 30 stamp Sheep Creek mill, and that the Perseverance mill referred to had much more and heavier power consuming concentration machinery per stamp than the 30 stamp Sheep Creek mill had, and besides had in addition concentrate grinding machinery, less than 90 horse-power would be required to operate the Sheep Creek 30 stamp-mill and mines. Making allowances for the heavier stamp and additional concentration machinery in the 100 stamp-mill referred to, compared with the 30 stamp Sheep Creek mill, less than 60 horse-power would be required to operate the 30 stamp-mill and Sheep Creek mines.

Above quotation is in error in assuming that there is sufficient water in Sheep Creek for more than six months of each year to generate 300 electric horse-power.

Answer to Direct Interrogatory No. 20:

(Deposition of F. W. Bradley.)

Yes, I have known Mr. H. L. Wollenberg for a number of years. [633]

Answer to Direct Interrogatory No. 21:

Yes, H. L. Wollenberg sought an interview with me on April 23, 1912, in my office in this city, and we then and there had a conversation in relation to the contract referred to.

Answer to Direct Interrogatory No. 22:

The conversation was held in my room, 1024 Crocker Building, in the presence of my stenographer, Miss H. M. Wagener.

Answer to Direct Interrogatory No. 23:

H. L. Wollenberg claimed to have called upon me in his official capacity as Chief Engineer of the Alaska Gastineau Mining Company, plaintiff in this action.

Answer to Direct Interrogatory No. 24:

I notified Mr. Wollenberg that his company was not entitled under the Oxford contract to anything more than current to the amount of 300 electric horse-power and that they could not use this current in any way so as to interfere with the speed and safety of the motors in use for running the defendants' mining and milling plants on Douglass Island. Mr. Wollenberg stated that the purpose of his call on me was to discuss how his company should install electrical machinery so as to best utilize the Oxford contract. In discussing the circuit-breaker with Mr. Wollenberg, he said they wanted something that would not throw out until after a peak had lasted for a number of seconds or minutes. I told him

(Deposition of F. W. Bradley.)

that the circuit-breaker had to throw out instantly there was any demand for current in excess of 300 electrical horse-power; furthermore, that many power contracts compel the customer to pay for peaks of any kind no matter whether they are momentary or of longer duration. I further stated to him that this was the kind of power the Oxford contract called for [634] because the contract valued the 300 horse-power at \$25,000 and not at \$150,000, the price his company paid for it. Mr. Wollenberg at the time admitted to me that by installing a synchronous motor they could use the 300 horse-power without peaking or disturbing the current on our line for the Douglas Island milling and mining plants.

Answer to Direct Interrogatory No. 25:

Yes, on October 31, 1910, I told L. P. Shackleford exactly the construction I placed upon the contract referred to.

Answer to Direct Interrogatory No. 26:

Such information was conveyed to Mr. L. P. Shackleford in the office and presence of H. H. Taylor, deceased, Mills Building, this city, and was confirmed by copy of letter I wrote on the same day to Prof. C. L. Cory, copy of which was handed to Mr. Shackleford. At this meeting L. P. Shackleford stated he thought that the current of not to exceed 300 electrical horse-power was worth more than the \$25,000 valuation placed upon it, the land, wharf, machinery, etc., by the contract, and that therefore, he would exercise his option to take the power and offer it for sale. He, therefore, exercised

(Deposition of F. W. Bradley.)

such option and gave us the first chance to buy the power, asking us to make an offer for it. I took issue with him then and there and stated that the power was not worth more than \$25,000 because of the terms of the contract and the small winter flow of water in Sheep Creek.

Answer to Direct Interrogatory No. 27:

Such information was conveyed in my letter of October 31, 1910, to Prof. C. L. Cory by delivering a copy to L. P. Shackleford, and copy of which is attached hereto and marked Exhibit "C." Such information was also conveyed in my letter of December 13, 1910 to Prof. Cory by mailing a copy to L. P. Shackleford, and copy of which is attached hereto and marked [635] Exhibit "C-1." Attached hereto is a copy of my letter of December 14, 1910 to L. P. Shackleford and marked Exhibit "C-2."

Answer to Direct Interrogatory No. 28:

Yes, I am familiar with the deed referred to as the second contract of April 22, 1911.

Answer to Direct Interrogatory No. 29:

The execution of this contract was due to the completion of our generating plant of sufficient size and efficiency and to the election of the Oxford Mining Company to take the current of not to exceed 300 electric horse-power in lieu of the agreed value of \$25,000 for the water right and other property conveyed by this deed. The execution of this deed was contemporaneous with the contract of same date, made on account of suits brought against the de-

(Deposition of F. W. Bradley.)

pendant companies herein by the Perseverance or Alaska Gastineau people, claiming under a so-called Gilbert contract certain rights to the waters of Sheep Creek.

Answer to Direct Interrogatory No. 30:

Yes, I am familiar with the contract of April 22, 1911, referred to as the third contract.

Answer to Direct Interrogatory No. 31:

Yes, this contract is still in full force and effect. In addition to the facts stated in my answer to Interrogatory No. 29, one of the facts that lead up to the execution of this contract was the recording in the records of the Juneau Mining District in January, 1911, of a certain instrument executed between Joseph T. Gilbert and Alaska Perseverance Mining Company.

This instrument contained the so-called Gilbert agreement of June 17, 1897, certain clauses of which had to do with the then developed water right on Sheep Creek. February 6th, [636] 1911, L. P. Shackleford wrote me as follows regarding this contract:

Juneau, Alaska, February 6, 1911.

Mr. F. W. Bradley,

Crocker Bldg.,

San Francisco, Cal.

Dear Mr. Bradley:

Your several telegrams with reference to the suits against the Treadwell Company on account of the Sheep Creek water rights have been received and I shall use every effort to get my work in shape so that

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I can leave here and be with you on the 23d of February. If I am a day or two late, I will notify you by wire.

Frankly speaking, unless I discover something new in the information that I have wired for from the east, I am inclined to think that the Gilbert contract will be held binding, but I am of the opinion that it would only be held binding to the extent of the power development that had taken place at the time the contract was executed as the use of the surplus water in the contract referred to the surplus water in the pipes and flumes of the old Nowell Company.

I am satisfied in my own mind that a court of equity would hold that we had a right to enter into any contract with reference to the mill site and water rights mentioned in our lease, provided the status of the parties with reference to the power was preserved to all practical purposes, and I claim our lease preserves the status of the parties by giving us power in excess of the amount that could have been developed in the old plant, and that the Treadwell Company can secure adequate protection at all times by setting this up as a defense and by interpleading the Oxford Company with Perseverance Company. [637]

I am also satisfied that no claim for damages can be based on this contract until a bona fide attempt is made to demand the rights therein contracted for.

It may turn out to be fortunate that the lease provides adequate assurance to the successors of the Nowell Company of power equal to and in excess of the amount developed at the time the Gilbert contract

(Deposition of F. W. Bradley.)

was executed. I think it is perfectly plain that our lease is a flood water contract and the Oxford Company is in a position to stand between you and Gilbert and his assigns.

I wish you would discuss this with Mr. Flourney somewhat before I reach Frisco so that we can have his views upon the subject. I have not received the amended bill of complaint yet but the original complaint has been framed in such a way that I do not see how any rights under the easement contract can be brought into the action at this late day, so that the question with us will be one of watching carefully and waiting until the easement contract is brought forward in a proper action.

As far as my presence here in May is concerned, I have already told Mr. Kinzie I would come up here and try the matter before the Land Office involving the beach rights in front of the Ready Bullion so that I will have to be here at that time.

It is needless to say, however, that the question under the Gilbert contract will have to be watched for some years and I am quite anxious to see you and lay out some definite plan with reference to same.

Yours very truly,

LEWIS P. SHACKELFORD.

This letter states that our agreement with the Oxford Mining Company is a flood water contract and intimates that under certain conditions the Gilbert contract might be held binding, but [638] takes the position that the Oxford Company is in a position to protect us from the Gilbert contract.

(Deposition of F. W. Bradley.)

Therefore, the execution of this contract of April 22, 1911, was to protect us in case any of the waters of Sheep Creek were taken away from our plant under the so-called Gilbert contract. That is, we are protected by this contract of April 22, 1911, to the extent that the Oxford Mining Company shall only be entitled to the 300 horse-power of electric current provided in the agreement of October 14th, 1909, decreased by the number of horse-power that could be generated by us at our plant with the water of which we may have been deprived by the so-called Gilbert contract.

To further protect us in the matter, L. P. Shackelford, March 13, 1911, offered in writing to continue as attorney for the defendant companies herein in all cases involving their rights to property described in the lease and agreement made to them by the Oxford Mining Co., and dated October 14, 1909, and such offer was accepted in writing.

Answer to Direct Interrogatory No. 32:

Yes, I have in my possession the original contract referred to of October 14, 1909.

Answer to Direct Interrogatory No. 33:

The original of the above referred to contract is hereto attached and marked Exhibit "D." I also hand you a copy of this same contract to be certified to as correct.

Answer to Direct Interrogatory No. 34:

No, I have not the original deed, or second agreement, referred to. It must be at the Treadwell office in Alaska, as it was sent to Juneau to be recorded and

(Deposition of F. W. Bradley.)

was recorded May 9th, 1911, in Book 22, of Deeds, page 546 of the records of said district. [639]

This deed or contract is recorded as per my previous answer, but attached hereto is a copy marked Exhibit "E."

Answer to Direct Interrogatory No. 36:

Yes, I have the contract of April 22, 1911, referred to as the third contract.

Answer to Direct Interrogatory No. 37:

The original of the above referred to contract is hereto attached and marked Exhibit "F." I hand you a copy of this same contract to be certified to as correct.

Answer to Cross-interrogatory No. 1:

The horse-power requirements of the machinery necessarily used in connection with the Sheep Creek Mines prior to October 14, 1909, was:

30 stamp-mill light stamps.....	55 H. P.
Vanners.....	6 H. P.
Rock Crusher.....	10 H. P.
Lights.....	4 H. P.
Compressor.....	75 H. P.

Total.....150 H. P.

This ore was hauled from the mine bin to the mill bin by means of steam locomotives of 5 or 10 horse-power capacity over a narrow gauge railroad track. There was some abandoned and discarded machinery in and about the mill and mines, but none of it was necessary for the successful operation of the 30 stamps.

(Deposition of F. W. Bradley.)

At the Douglas Island Mines, the total consumption of horse-power per ton of ore, outside of hoisting and pumping amounts to 1.24. Assuming the 30 stamp-mill had a crushing capacity of 80 tons per day, this would mean for the operation of [640] the mine and mill a total of 100 horse-power including the steam locomotive haulage.

Answer to Cross-interrogatory No. 2:

All of the Sheep Creek machinery, pipe-lines, material, etc., purchased from the Oxford Mining Company by the defendant companies herein was moved to Douglas Island, and it is quite probable that one of the compressors which had been used in connection with the Sheep Creek Mines prior to October 14, 1909, is now in use at Snow Slide Gulch by the Alaska-Juneau Gold Mining Company. I do not know this as a fact, as Superintendent R. A. Kinzie has had and has charge of all installations of machinery and apparatus.

My understanding is that a 200 horse-power motor has been ordered to run this compressor but that it has not yet arrived. If this is the same compressor, it was while at Sheep Creek run by direct water-power under flood water conditions. That is, probably it was run six months in the year during the flood water season, and was idle, or partially idle, during the remaining six months of each year for lack of sufficient water to run it.

Answer to Cross-interrogatory No. 3:

No, not necessarily. My understanding is that the starting surge depends upon the type of motor, its

(Deposition of F. W. Bradley.)

installation and its operation; and it also depends upon whether the disposition of the user is friendly or unfriendly to the party generating the power. In the case of a 200 horse-power induction motor, the starting surge can be overcome by installing a small induction motor, too small to cause any line disturbance and large enough to bring the larger induction motor up to speed or nearly to [641] speed, when the current for the larger induction motor can be thrown in without causing any starting surge or disturbance. In this manner a large 400 horse-power motor is started up for driving an air compressor at the Utica Mine, Angels Camp, this State; and it is so started up without causing any peaks or disturbances. Answer to Cross-interrogatory No. 4:

A synchronous motor was not ordered to operate the compressor at Snow Slide Gulch because our power contract does not require it. All our motors are for but temporary use in their present positions and will shortly be removed for use in other places for other purposes as part of a comprehensive hydro-electric power plan now being worked out. Therefore, for present temporary purposes, we are using a cheaper type and less efficient form of water.

Answer to Cross-interrogatory No. 5:

Incorporated in my answer to direct interrogatory No. 11 is a copy of my letter of August 10th, 1909, to Henry Endicott and for that reason it is not repeated here.

As to my expectation that the Oxford Mining Company would use any other than the ordinary type of

(Deposition of F. W. Bradley.)

induction motor, I was indifferent, knowing that the essence of the contract was the setting aside of a certain limited quantity of the Sheep Creek water for the Oxford Mining Company. I was guided in making the contract on my part by my experience in making electric power contracts for the Tacoma Smelting Company, Bunker Hill & Sullivan Mining & Concentrating Company and Oneida Gold Mining Company, all of which companies I was President of prior to August, 1909.

In each of these contracts, I had been thoroughly impressed with the determination of the Power Company to penalize [642] and punish the customer for any and all peaks. These contracts not only penalized for peaks but in the case of the Bunker Hill & Sullivan contract, the Power Company insisted that the consumer could not install any motors or electrical apparatus without furnishing to the Power Company plans and specifications and obtaining the approval of the Power Company before any such motors or apparatus could be installed—the penalty in this case consisting of cutting off the current without working a breach of the contract.

In the case of the Tacoma Smelting Company, the Power company's contract provided for the highest power factor obtainable from standard motors and apparatus and that all motors and transformers installed by the Smelting Company should be of the same efficient type.

The Smelting Company was also required to so operate its plant as to fit in with and to be a benefit

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to the general load and required power conditions of the Power Company.

In the case of the Oneida Gold Mining Company, we were required to install a 200 horse-power synchronous motor in order to work in harmony with the Power Company.

In drawing up the contract, neither Mr. Shackelford nor myself being electrical experts, we avoided the terms of the usual power contract and I considered I was absolutely safeguarding the defendant corporations herein with the limitation "A CURRENT OF NOT TO EXCEED 300 ELECTRIC HORSE-POWER FROM AND AT THE GENERATING PLANT" in lieu of any penalty provision for peaks. I knew that 150 Horse-Power was ample for the 30 stamp mill scale of working and that the 200 afterwards raised to 300 Horse-Power limit provided ample margin. It was therefore not necessary for the usual stipulations as to penalties for peaks and for cutting off the power in case of the installation of inefficient [643] machinery. This was strictly my point of view in making the contract, while as it turned out afterwards Mr. Shackelford's point of view was the salability of the contract by not limiting the use of the power to the 30 stamp mill and Sheep Creek mines, as proposed by me in my letter to Henry Endicott, and by not permitting the contract to show on its face that for a number of months of each year Sheep Creek does not flow sufficient water to make much, if any, power at all.

This letter to Mr. Endicott was written before the

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contract was finally shaped up between L. P. Shackleford and myself, Mr. Shackleford at the time being attorney for all the parties. In strict conformity with my letter, I wanted to limit the use of the power to the 30 stamp mill and Sheep Creek Mines, but L. P. Shackleford objected to this limitation and the limitation was agreed to of A CURRENT OF NOT TO EXCEED 300 ELECTRIC HORSE POWER FROM AND AT THE GENERATING PLANT. Also, to strictly conform with my letter that the power was to be used to work the 30 stamp mill and mines as they had been worked in the past, I wanted the contract on its face to show that there would be periods during each year when there would not be water enough in Sheep Creek to furnish sufficient, if any, power. L. P. Shackleford would not agree to this, because the contract, with its nine-year optional period as to taking the power or \$25,000 was to be used as an inducement for selling the Sheep Creek Mines, which had been a source of trouble and expense to their owners, had been shut down for several years and were considered to be of very doubtful value. Therefore, I had no expectations that the Oxford Company would ever have much occasion to use any kind of motors and the contract was so drawn as not to complicate it with any stipulations as to character of motors, apparatus, machinery or transmission line. Our duty was to be complied with the generation of the power, which the user could use or waste as he [644] pleased.

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Answer to Cross-interrogatory No. 6:

This letter of August 10th, 1909, was very general in its terms and referred to a certain document for particulars. This document, after a number of changes made by Mr. Shackelford and myself, became the contract of October 14th, 1909. Neither Mr. Shackelford nor myself being qualified to indulge in electrical terms, made the contract absolutely definite with the provision that there could not be drawn from the generating plant by the Oxford Company any current in excess of 300 electric horse-power. With this provision and our understanding at the time that there was no necessity, as I have already explained, for going into the character of machinery to be installed by the user or consumer. Thus it was left absolutely optional with the consumer to make good or inefficient use of the current as he should see fit. He could use nearly all the power up in a cheap transmission line and in cheap and inefficient motors or he could invest in heavy copper wire and in the more costly synchronous motor and so secure a high percentage and undisturbed use of the power in the current generated for and delivered to him at all times when there is sufficient water in Sheep Creek to generate 300 electric horse-power.

Answer to Cross-interrogatory No. 7:

October 31, 1910, L. P. Shackelford, the attorney for the Oxford Company, told me that he considered the power worth more than the \$25,000, and would try to sell it, but would give us the first chance to buy. I replied that the power under the terms of the con-

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tract was not worth more than \$25,000, and offered that much for it, without quibbling as to such portion of the \$25,000.00 valuation as should apply to the land, buildings, [645] machinery, etc., secured from the Oxford Mining Company, together with the water right. My reasons being that no peaks in excess of 300 Horse-Power would be permitted, that the user of the power would have to suffer all the transmission and other losses and that there was not water enough in Sheep Creek all the year round to generate the power.

Answer to Cross-interrogatory No. 8:

The offers to sell always initiated with L. P. Shackelford. He always asked me to bid and I never even asked for his asking price. We probably did have some conversation in February, 1911, and in response to an invitation from L. P. Shackelford to bid for the power, I refused to offer more than the \$25,000.00 valuation placed upon the power by the contract itself, for the reasons stated in my previous answer.

Answer to Cross-interrogatory No. 9:

Assuming that the date October, 1909, is intended for October, 1910, I may have stated that horse-power was worth \$40.00 per annum, but this would mean mechanical horse-power made by steam twelve months in the year in large units and not water horse-power made during the flood water season of but six months per year in small units. I deny that H. H. Taylor ever mentioned the figure \$150,000. Whatever he said must have been said in the presence of L. P. Shackelford and myself and the conversation

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on his part could not have been based on any knowledge as to conditions either contractual or physical. That is, he had given the matter no continued study at all, was not familiar with the situation and whatever he may have said was in the way of joking with myself and Mr. L. P. Shackelford, who was then our attorney. I do not believe that the figure of \$150,000, or any similar figure was ever mentioned at all, as I was positive in the expression of my belief that the 300 electric horse-power was not [646] worth more than the contract valuation of \$25,000.00. I have always been consistent in my position that the Oxford Company could not get the full use of 300 horse-power without appropriate appliances not only because the contract does not provide for peak loads but because there is not enough water in Sheep Creek throughout the winter months and because necessarily the Oxford Company taking the current from and at the generating plant would have to suffer all the transmission and other losses. In other words, the contract was based on Sheep Creek water of which the Oxford Company was to have enough to make 300 electric horse-power but not more. Or, as L. P. Shackelford said in his letter of February 6th, 1911, to me (incorporated in my answer to Interrogatory No. 31), the contract is a flood water one.

Answer to Cross-interrogatory No. 10:

I do not know what Mr. Kinzie's contention has been, but my contention has always been that the power is not worth more than the contract valuation of \$25,000., because under it no peaks whatever in

(Deposition of F. W. Bradley.)

excess of 300 horse-power are permitted, because the Oxford Company has to stand all transmission and other losses, and because there is not enough water in Sheep Creek during the winter months of each year to make much, if any, power. I have never said that the contract did not mean more than 100 horse-power, as it means whatever use the Oxford Company desires to make of it. They can either absorb nearly all the power in inefficient apparatus or else make a beneficial use of a high percentage of it whenever there is enough water in Sheep Creek to generate it. I have always maintained that by the installation of a synchronous motor the Oxford Company could get a high percentage of the 300 horse-power, or they could secure as much benefit in using it for electric lighting, or they could secure as much benefit in having a number of small induction [647] motors at work, such as would be installed for working a 30 stamp mill and mine, or they could similarly benefit by having a small induction motor installed for starting up one large induction motor—all providing there is enough water in Sheep Creek to generate the power.

Answer to Cross-interrogatory No. 11:

As I have already stated, the contract of October 14, 1909, as finally shaped up, was not the same as the document referred to in my letter of August 10, 1909, to Henry Endicott. A limit of peaks to 200 horse-power will absolutely and satisfactorily take care of a number of small motors required for a light 30 stamp mill and mine operation consuming

(Deposition of F. W. Bradley.)

a total of 150 horse-power. The power under the contract can be efficiently utilized either for electric lighting purposes or by a synchronous motor, or by a number of small induction motors, or by the installation of a small induction motor for starting up a larger induction motor. These uses, of course, being limited to the months of each year during which there is sufficient water in Sheep Creek. L. P. Shackleford did not want this condition as to lack of water the year round to show in the contract and instead of it, is the provision protecting us from all operating and physical causes beyond our control to cover both a shortage of water and inefficient use of the power as well as other contingencies.

If the current provided for by the contract should be efficiently and economically used it would provide more power than was utilized for driving the 30 stamp mill machinery on the property prior to August 19, 1909. This condition was acknowledged by L. P. Shackleford's letter of Feb. 6, 1911, to me (incorporated in my answer to Interrogatory No. 31), in which he said, in effect: [648]

“The power provided for in the contract is in excess of the amount that could have been developed in the old plant.”

So, in stating in my letter to Mr. Endicott that the 30 stamp mill was amply large enough for the mine and that 150 horse-power was all that was ever required for operating both the mines and 30 stamp mill and in allowing 33 $\frac{1}{3}$ % margin or a margin of 50 horse-power afterwards increased to a margin of

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150 horse-power, I was absolutely fair and frank in my letter. Especially in view of the fact that my letter had definite reference to the 30 stamp mill operation, and for such operation the motors would necessarily be of small units and could be easily started up one at a time without exceeding the then proposed limit of 200 electric horse-power, which was afterwards increased to a limit of 300 electric horse-power.

Answer to Cross-interrogatory No. 12:

All I know is that H. L. Wollenberg claimed to be the representative of the people who would use the 300 horse-power and our conversation was quite heated because of my insistence that he tell me his exact official capacity and who he represented. He represented himself to be and stated that he called in his official capacity as chief engineer for the Alaska Gastineau Mining Company. I did not question him as to the title or options on the Oxford property, although I understood that payments had been made on an option price and that Wollenberg represented both the owners and the option holders.

Answer to Cross-interrogatory No. 13:

When demand was made for power, I wanted specific proof to be sure that the party demanding the power had succeeded to all the liabilities of as well as all the benefits of the three several contracts between the Oxford Mining Company and the defendant corporations herein, all three of said contracts still being in full force and effect. I never received such proof, [649] but had the power

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delivered with the idea of thereby saving trouble with neighboring operators. One of the liabilities referred to being the provision in the contract of April 22, 1911, agreeing that if the Gilbert contract should deprive our plant of any of the waters in Sheep Creek than the 300 horse-power of electric current provided in the agreement of October 14th, 1909, should be decreased correspondingly.

Answer to Cross-interrogatory No. 14:

I do not know of synchronous or any other type of motors in use for power purposes in the Juneau Mining District prior to October 14, 1909, except the direct current generators and motors that constituted a portion of the power plant we purchased from the Oxford Mining Company.

Answer to Cross-interrogatory No. 15:

Prior to October 14, 1909, the only motors in use upon mining loads in the Juneau Mining District were the direct current motors supplied with direct current from the power plant, we purchased from the Oxford Mining Company. In other mining districts induction motors were in use but not to the exclusion of either direct current motors or synchronous motors.

Answer to Cross-interrogatory No. 16:

Because I preferred to pay for the consumption of more power in a cheaper type of motor rather than to tie up the money in a more efficient and higher priced motor to be used on a piece of temporary work.

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Answer to Cross-interrogatory No. 17:

Attached hereto is the original contract between Alaska Treadwell Gold Mining Company and Alaska Juneau Gold Mining Company of September 12th, 1911, marked "Exhibit C." I hand you a copy of this same contract to be certified to as correct. [650]

Answer to Cross-interrogatory No. 18:

I do not know the character of the arrangement of this circuit-breaker, if there is one, but assume that any rough, unskilful or careless starting up of the Alaska Juneau motors would instantly throw out something so as to prevent any disturbance of the Alaska Treadwell power conditions.

Answer to Cross-interrogatory No. 19:

Contract provides payment of one cent per kilowatt hour and Alaska Juneau Gold Mining Company pays accordingly for all electric power it consumes. The contract, other than the requirement of a high price, does not penalize for surges, if any, and these surges, if any, are so measured as to secure the contract price. The Alaska Juneau motors are undoubtedly started up and run with the same skill, care and consideration with which all the Douglas Island motors are run. That is, there is one general management, the operations are entirely friendly and care is taken to avoid the unnecessarily sudden starting up of motors with great surges thereby causing undue disturbances.

Answer to Cross-interrogatory No. 20:

My latest information is that the 200 horse-power

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motor for Snow Slide Gulch has not yet arrived. I do not know the type of this motor or how efficient or inefficient it is or what it requires as to starting surge, if it requires any. The money value of thirty seconds power would be insignificant, but the money value of the extra generating plant that would always have to be in commission and ready to take care of peaks would be a considerable amount. For example, the money value of extra generating plant to the extent of 400 horse-power would be from \$20,000 to \$80,000. [651]

Answer to Cross-interrogatory No. 21:

I have no information that such a wattmeter was ever ordered. Mr. Kinzie has charge of all machinery installations as stated in my reply to Cross-interrogatory No. 2.

Answer to Cross-interrogatory No. 22:

I have no information that such wattmeter was ever ordered or delivered.

Answer to Cross-interrogatory No. 23:

Assuming that such wattmeter had been ordered, I presume that its use would be to obtain a record of the average load delivered by the water-power plant to any circuit and to compare this average load with the maximum as well as the minimum load delivered by the water-power plant to any circuit. Also such a wattmeter would be used to determine the proportion of part of the total output of the water-power plant which was delivered to any circuit during any given time. The term apparent power I understand to mean the total power in the

(Deposition of F. W. Bradley.)

current given out by the generator, a high percentage of which can be utilized through a synchronous motor and in other ways. The term real power, I understand to mean the power output of either a synchronous or induction motor, which may utilize 99% or 10% of the power in the current according to the type of machinery, the character of the installation and the skill of operation.

Answer to Cross-interrogatory No. 24:

Yes, this is a substantial copy of my letter of October 31st, 1910, to Professor C. L. Cory, copy of which was requested by and delivered to L. P. Shackleford at the time.

Answer to Cross-interrogatory No. 25:

This letter was written after consultation with our [652] attorney L. P. Shackleford, who was at the time attorney for the Oxford Mining Company. Mr. Shackleford made no suggestion at the time that a copy of the contract and a copy of my letter to Henry Endicott should be sent to Professor Cory. Nor did Mr. Shackleford make any protest at the time, nor has he made protest since, to my knowledge, for not having done so, or for so expressing myself as to the value of the 300 horsepower. Mr. Shackleford was our attorney in the matter, as well as the attorney for the Oxford Mining Company, and I was not referring the matter to Professor Cory as a legal proposition, but on the basis of certain assumptions, I voluntarily referred the matter, with L. P. Shackleford's knowledge and consent, to Professor Cory as an electrical engineer.

(Deposition of F. W. Bradley.)

Answer to Cross-interrogatory No. 26:

Yes, the letter to Professor Cory was written because Mr. Shackelford claimed that the right to the power was of greater value than the \$25,000.00 we had formerly agreed upon as the value of the water right together with the land, buildings and machinery. L. P. Shackelford asked us to make an offer for the power. I refused to make an offer greater than the value placed upon the power by the contract itself, for the reasons that as hereinbefore stated the contract did not permit of any peak loads, the Oxford Company would have to stand all the transmission and other losses, and there would not be enough water in Sheep Creek during certain periods of each year to generate sufficient power the year through; but I told Mr. Shackelford that I would take the question up with an electrical authority and then wrote the letter to Professor Cory with Mr. Shackelford's knowledge and consent.

Answer to Cross-interrogatory No. 27:

This letter does not attempt to construe the contract as to apparent or real power. By apparent power I understand the [653] total power in the current given out by the generator, a high percentage of which can be utilized through a synchronous motor and in other ways. By real power, I understand the power output of either a synchronous or induction motor, which may utilize 99% or 10% of the power in the current according to the type of machinery, the character of installation and the skill

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of operation. My construction of the contract was very definite in that the user of the 300 electric horse-power would have to stand all losses involved, and that the peak loads could not exceed 300 electric horse-power at the generating plant.

This letter was not written to construe the contract as to apparent or real power; but, on the assumption that the Oxford Mining Company had the right to take 300 electric horse-power from and at the generating plant, the question was asked as to the value of this right to us as a purchaser under not only the terms of the contract itself but under other conditions pertaining to our own power systems and requirements.

Answer to Cross-interrogatory No. 28:

This letter was written on October 31st, 1910, the same day that Mr. Shackleford first suggested that the power was worth more than \$25,000, and asked me to bid for it. Mr. Taylor never considered, suggested or tried to make any such payment as \$150,000.00 and no such figure was ever mentioned. There never was an occasion for my objecting to any action wanted by Mr. Taylor for the reason that the matter was in my hands from the very beginning.

F. W. BRADLEY.

Subscribed and sworn to before me this 25th day of February, A. D. 1913.

[Seal]

P. J. KENNEDY,

Notary Public in and for the City and County of San Francisco, State of California. [654]

State of California,
City and County of San Francisco,—ss.

I, P. J. Kennedy, a duly appointed, qualified and acting notary public in and for the City and County of San Francisco, State of California, do hereby certify that the witness in the foregoing deposition named, F. W. Bradley, was by me first duly sworn to testify to the truth, the whole truth, and nothing but the truth; that thereupon his foregoing deposition was taken by me in the City and County of San Francisco, State of California, on the 24th day of February, 1913, at the hour of two o'clock P. M. of said day, and thereafter until completed; that I propounded said direct interrogatories and cross-interrogatories to said witness; that said witness answered said interrogatories, both direct and cross, and his answers are fully set forth in the transcript of said deposition attached hereto, and that he handed me Exhibits "A," "C," "C-1," "C-2," "D," "E," "F" and "G," all of which exhibits are referred to in said deposition, and are a part thereof, and which said exhibits I have caused to be attached to said transcript of said deposition. I further certify that Estelle Starstrand, a disinterested person, was appointed by me to act as shorthand reporter to take the testimony of said witness in shorthand, and thereafter reduce the same to longhand typewriting, and was by me first duly sworn for that purpose; that said answers of said witness F. W. Bradley to said direct and cross-interrogatories were reduced to longhand typewriting by said Estelle

Starstrand, and when completed as herein set forth were carefully read by said witness, and after being corrected by him in every particular desired, were by him subscribed in my presence. That I thereupon wrapped and sealed the said deposition with said exhibits, and directed it to the Clerk [655] of the District Court for the Territory of Alaska, Division No. 1, at Juneau, in which court said action is pending, in the manner and pursuant to the terms of the stipulation of respective counsel for the respective parties attached hereto.

Witness my hand this 25th day of February, A. D. 1913.

[Seal]

P. J. KENNEDY,

Notary Public in and for the City and County of San Francisco, State of California. [656]

Exhibit "A" [Attached to Deposition of F. W. Bradley].

New York, June 12th, 1911.

The Alaska Gastineau Mining Company, Alaska Consolidated Mines Limited, Alaska Perseverance Mining Company and The Security Holders and Creditors thereof:—

Gentlemen:—

You are interested in a group of mines situated near Juneau, Alaska, formerly operated under the title of the Alaska Perseverance Mining Company and now being operated under the title of the Alaska Gastineau Mining Company.

Mr. W. P. Hammon, of San Francisco, and I control certain properties known as the Sheep Creek

group, Ground Hog group, and also certain water rights, all of which join or are adjacent to the Perseverance Mines.

A consolidation of the properties owned by the Alaska Gastineau Mining Company and the properties owned and controlled by us should be made, for the following reasons:

FIRST.—All three groups are on the same lode and will have to be worked through a long tunnel which will permit of the delivery of ore to mills on Tide-water. The expense of such tunnel will be so large as to require the union of the properties to warrant its construction. All three groups can be readily worked through this one tunnel.

SECOND.—The Perseverance Mines are without water, both for power and battery use to work them profitably, whereas the Sheep Creek, and Ground Hog groups control the only available water, both for battery and power, in sufficient amounts to supply all of these groups.

THIRD.—The Ground Hog group claims certain apex rights to the lode now being worked by the Perseverance Mines, the rights of which are yet to be determined in the courts, involving protracted litigation.

FOURTH.—These properties will require large sums of new money for development and equipment to put them on a paying basis and for the reasons mentioned above, particularly the apex situation, new money cannot be raised to develop the Perseverance Mines alone.

Consolidation with the Ground Hog and Sheep

Creek groups with their attending water rights and merger of their apex claims from forestalling litigation on that subject is deemed to be essential.

The sudden death of Colonel Sutherland made it seem advisable for us to open up negotiations looking towards this end or towards the purchase of your properties. It so happened that Mr. R. F. Laffon whom I have known for some years, and who I understand has been acting as attorney for Mr. Sutherland and the properties in which are interest, arrived in San Francisco at this particular time. I met him there and took the matter up with him, at the same time introduced him to Mr. Hammon, so that he might know who Mr. Hammon was and could ascertain his financial standing and the position which he occupied in relation to the mining world. I think Mr. Laffon will vouch for the statement that Mr. Hammon is one of the most important and successful mining operators in the West to-day. [657]

Mr. Laffon who is familiar with our properties and the general situation, agreed with us that a consolidation was inevitable, and suggested that I come East to take the matter up with the various interests addressed in this letter. Attached hereto is a letter from Mr. Hammon, stating his intention and the object of my trip.

Upon my arrival in New York City, on June 1st, 1911, I again met Mr. Laffoon, and also your President, Mr. Joseph T. Golbert, Mr. Jerome, and Mrs. W. J. Sutherland, and after *the* had ascertained to their satisfaction the position which we occupied in relation to the Perseverance Mining Company by

virtue of the control of the water rights and adjacent mining property and the sincerity of our intent, they furnished me with all the information and have assisted me in every way possible; with the understanding, of course, that this information would be used in good faith and only in connection with the object of my trip.

Before taking up the plan looking towards a consolidation or purchase, it will be necessary to outline as briefly as possible the present situation of the property as I now understand it; Each subject will be arranged in a separate clause and enumerated "A," "B," "C," &c:—

A.

THE ALASKA PERSEVERANCE MINING COMPANY.

In the year 1901 W. J. Sutherland obtained an option from J. T. Gilbert on a group of mining claims now known as the Perseverance group, containing the Rimrock, Perseverance, Perseverance No. 1, Alta, Alta No. 1, Jumbo, Jumbo No. 1, Lurvie, Gold Creek Water Rights and four mill sites. The option price was \$200,000. Cash.

Mr. Sutherland then proceeded to organize what is known as the Alaska Perseverance Mining Company, under the laws of the State of New York, having a capitalization of \$500,000, shares par value \$5. each, or a total capitalization of \$500,000. Of this amount 99,995 shares were issued to himself in payment for the option, which he assigned to the Company. The other five shares were paid for in cash and held by the directors of the company as qualifying shares. Mr. Sutherland then undertook to, and

did, raise sufficient moneys to develop and equip the properties to the extent of driving a cross-cut known as the Alexander Crosscut, which tapped the lode system approximately 1000 feet in depth, upraising to the surface, drifting on the lode, building boarding houses, flumes, pipe lines, and 100 Stamp Mill, compressors, &c., and in all equipped the property and started it running, and it has been operated by the Alaska Perseverance Mining Company up to the time of its merger into the Alaska Gastineau Mining Company of this year.

In raising the sums of money necessary to do the above, Mr. Sutherland borrowed money of his personal notes, with the understanding that he would receive credit from the Alaska Perseverance Mining Company for all such sums advanced. A list of credit shown is appended hereto and marked "A-2." In order to give security for some of this money, and to pay Mr. Gilbert for the property under the option, Mr. Sutherland organized a new company in England, with the idea of selling its securities there, which hereinafter will be called the English company, known as:— [658]

B.

THE ALASKA CONSOLIDATED MINES LIMITED.

The Alaska Consolidated Mines Limited was organized in England in December, 1904, having the following capitalization:

1,500,000 shares, par value 1 pound sterling, or\$7,500,000
3,000,100-Pound sterling Debentures, or— 1,500,000
par value.

Mr. Sutherland then agreed to and turned over to the English Company the 99,995 shares of the Alaska Perseverance Mining Company, by placing it in trust (on account of the United States Laws) in the United States Mortgage & Trust Company of New York City, in exchange for 1,100,000 shares or \$5,500,000 par value of stock, and 3,000 100-Pound Debentures, or \$1,500,000 par value of debentures, which was all of the debentures of that company. There was left in the treasury of this company 400,000 shares, \$2,000,000 par value of stock, which, under agreement made with the Company was to be distributed as follows:

300,000 Shares, or \$1,500,000 par value of stock was to be left in the Treasury for the purpose of converting the \$1,500,000 par value of debentures into stock of this company;—and has never been issued, and

100,000 shares or \$500,000 par value of stock was reserved in the treasury and is still there.

This completes the distribution of the capital stock of this company. This \$5,500,000 par value of stock, and \$1,500,000 par value debentures which Mr. Sutherland received as stated above in return for the 99,995 shares of the Perseverance Company's stock he distributed as follows:—He delivered to Joseph T. Gilbert 1,000 debentures of the par value of \$500,000 in return for a deed to the properties which up to that time had not been paid for, under his option. He then caused the entire property to be conveyed to the Alaska Perseverance Company which then became the owner of the properties and the op-

erating company upon the understanding, however, that sums thereafter advanced for the Company by him were to be credited to him on the Company's books. All that the Alaska Consolidated Mines Limited of England owned was the 99,995 shares of the stock of the Alaska Perseverance Company; W. J. Sutherland owned all of the stock and debentures of this Alaska Consolidated Mines Limited, with the exception of the 1000 debentures, or \$500,000 par value of debentures which he had paid to Mr. Gilbert for his property, and the 400,000 shares which were left in the treasury of the Alaska Consolidated Mines Limited, for the purposes outlined above. He then proceeded to borrow money from various sources, which money was used as stated in Section "A," for the purpose of developing the property of the Alaska Perseverance Company, under the conditions of the Alaska Perseverance Company, under the conditions mentioned therein, giving as security for a part of this borrowed money, debentures and stock of the Alaska Consolidated Mines Limited which he owned. He also sold outright some stock and debentures, and used other portions for promotion purposes. Attached to this letter is a list which shows the complete distribution of stock and debentures which W. J. Sutherland owned in the Alaska Consolidated Mines Limited to date, and also a statement showing the stock and debentures which he pledged as security, stock and debentures which he sold or used for promotion purposes, and stock and debentures which he has left. (For list, see appendix "B-1" and "B-".)

On account of certain legal difficulties which arose, jeopardizing the rights of this English Company; and further, in order to arrange for new money to improve and equip the Perseverance Mines, W. J. Sutherland decided that it was necessary to organize a new American Company into which the two previous organizations—The Alaska Perseverance Mining Company of America, and the Alaska Consolidated Mines Limited of London—would be [659] merged. This new company is known as:—

C.

THE ALASKA GASTINEAU MINING COMPANY.

The Alaska Gastineau Mining Company was organized by W. J. Sutherland, under the laws of the State of New York on the 14th day of January, 1911. For letters showing the reasons for this new organization, original plan, &c., see appendix marked "C-1." Under the terms of the agreement, the Alaska Gastineau Mining Company was organized with the following capitalization:—

2,400,000 shares, par value \$5. or \$12,000,000. par value.

7,000—\$500-Dollar bonds, 6% or \$3,500,000. par value.

The Alaska Perseverance Company was merged into it, and by agreement the distribution of stock and first mortgage bonds of this new company was as follows:

PAR VALUE

FIRST:—1,500,000 shares, or.....	\$7,500,000
3,000 bonds, or.....	1,500,000

of the capital was distributed to W.

J. Sutherland in payment for the whole issue of the shares and debentures of the Alaska Consolidated Mines Limited, to-wit, 1,500,000 shares and 3,000 debentures, and in exchange for said shares and debentures. The shares to be ex-

Par Value

changed share for share and the debentures to be exchanged debenture for bond. Of the 1,500,000 shares of the Alaska Consolidated Mines, Limited, only 1,100,000 have been issued, the remaining 400,000 being left in the treasury so that but 1,100,000 shares of the amount allotted to W. J. Sutherland as above said, were to be exchanged for the English shares. Of the remaining 400,000 shares, 300,000 was to be used for raising new money and 100,000 to be used to cancel certain indebtedness against the two old companies.

SECOND:—700,000 shares, or.....	\$3,500,000
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stock is to be reserved in the treasury of the Company for the purpose of converting the full issue of the 7000 Bonds or \$3,500,000 par value

of the Company into shares if required.

THIRD:—200,000 shares left in Treas-

ury, or..... \$1,000,000

For marked details regarding this transaction, see appendix marked "C-2."

This company is organized and in operation. The mines in Alaska heretofore operated by the Alaska Perseverance Mining Company, are now operated by the Alaska Gastineau Mining Company. Each step necessary to make this company legal has been carried out.

Shortly after the completion of this organization, W. J. Sutherland, who was president and owner of the stock and bonds outlined above, died suddenly, so that these interests are now controlled by his estate.

D.

CONDITION OF THE SUTHERLAND ESTATE.

As nearly as can be ascertained, the Assets and Liabilities of his estate, so far as the Alaska Gastineau Mining Company is concerned, are as follows:— [660]

ASSETS.

PAR VALUE

- (1) Cash which he has advanced the Alaska Perseverance Mining Co. for the purpose of building and equipping the property, showing as a credit to him on its books.....\$ 500,000
- (2) Stock issued to him by the Alaska

Gastineau Mining Co. for the purpose of exchange with Alaska Consolidated Mines Ltd. stock to the amount of 1,100,000 and for other purposes.....\$5,500,000

(3) Bonds issued to him to be exchanged for debentures of Alaska Consolidated Mines Ltd. 3000 in the Alaska Gastineau Mining Company.....\$1,500,000

LIABILITIES.

	Cash.	Par Value Stock.	Par Value Bonds.
(1) Unsecured notes with interest for cash advanced in connection with these properties by Joseph T. Gilbert	\$612,000.		
(2) Claim of C. H. Pierce awarded by Court.....	25,000.		
(3) Craigvar Case Coal Claim.	6,000.		
(4) Alaska Gastineau Bonds exchanged for Alaska Consolidated debentures which were delivered to Gilbert in payment for the Perseverance property, 100 Bonds, or....			\$500,000.
(5) Alaska Gastineau Bonds which he had hypothecated as security for moneys advanced, and Bonds which he had sold outright or used for promotion purposes, 1,379 Bonds			689,500.
(6) Alaska Gastineau Stock which was hypothecated as security for moneys advanced by various parties and which was sold outright, or used for promotion purposes, 845,574 shares		\$4,197,870.	

For details see list "B-1" and "B-2"

This leaves a balance, according to the list belonging to the Sutherland estate, of 621 Bonds, par value \$310,500, and 254,426 Shares of Stock, par value \$1,272,150. The distribution of this is yet to be ascertained.

NOTE:—The amount of Stock and Bonds put up for security can only be correctly shown when the Estate is probated, or from the lists of the security holders themselves; but the majority of the stock and Bonds was put up as security and is held in a few hands which will be referred to later.

It is plain to be seen from the foregoing statement that the Alaska Perseverance Mining Company and the Alaska Consolidated Mines Limited were nothing more nor less than W. J. Sutherland, as he owned and controlled all of their stock, excepting that which he had hypothecated as security, or sold outright. It is further plain to be seen that a new arrangement in regard to the Alaska Gastineau Mining Company stock will have to be made before the properties can be financed, and that the only way in which this can now be done is by agreement: [661]

FIRST:—With the holders of secured and unsecured obligations of Mr. Sutherland;

SECOND:—With the holders of securities of the two mining companies;

THIRD:—With the Sutherland Estate itself.

It will be understood that the terms and agreements between the various companies and the Alaska Gastineau Mining Company must be fulfilled—that is to say: that the interchange of stock as outlined therein must be carried out, so that holders of securi-

ties and holders of stock and bonds in the other companies will hold Alaska Gastineau Mining Company stock and bonds instead of that which they formerly held.

Before taking up the idea of arranging the above, it will be necessary to analyse the present condition of the properties owned by the Alaska Gastineau Mining Company and the company itself:

PRESENT CONDITION OF THE MINING PROPERTY.

An examination of the properties situated in the Alaska and the reports (which are now available) by the superintendent in charge plainly show the following:

FIRST:—That the mine with its present equipment of 100 Stemps under the water supply for battery and power now owned by the company is unable to run for more than 4-1/2 months through the year, and will not be able to pay interest on its bonded indebtedness.

SECOND:—That although this milling plant can be increased by the addition of power, it cannot be run over 6 months in the year for lack of battery water, and would still be unable to pay interest on its present bonded indebtedness.

THIRD:—That the only supply of water in Silver Bow Basin available for battery use is the Granite Creek water already developed close to the Perseverance Mill, and that this water supply belongs to the properties which Mr. Hammon and I control. A glance at the maps will show this, and Mr. Gilbert and Mr. Laffoon are also familiar with this fact.

NOTE:—This is one of the reasons mentioned in the earlier part of this letter, viz.: that no one else will be able to undertake the financing of these properties without considering our properties.

FOURTH:—An examination of the milling record shows that there has been a total of 235,277 tons of ore milled during the four years operation of the company, and that this has given a net average recovery value of \$1.80 a ton. However, the milling record of 1910 showed a net average recovery of \$1.57 a ton. This will undoubtedly be more representative of the average recovery, because the ore is now being drawn from the full width of the stopes. The average mining and milling cost has been approximately .89¢ per ton with a slight reduction for the last year; but this does not consider the general expense, and the record shows that the full expense charged against the ore has been considerably over \$1.00. For the year 1910 it was \$1.05 per ton.

The Superintendent is probably correct in his figures that with a large plant, perfectly equipped, the mining and milling expenses could no doubt be reduced to 70¢ a ton. But this does not take into consideration the general expense which, of course, is chargeable against the ore, nor does it take into consideration the annual writing off of percentage on the cost of equipment, main tunnels, raises, and in fact all capital charges. I think there can be no doubt but what \$1.00 a ton is a fair figure to consider as total working cost, and that .50¢ a ton may be considered as the net profit. [662]

FIFTH:—In sizing up the ore bodies as shown by

the present development, the first thing of note is that the ore is only opened up on two sides, with the exception of that which is already broken and which is of a comparatively small amount; and that these two sides, namely; the surface and the Alexander Crosscut, are approximately 1,000 feet apart. The ore, therefore is not ore blocked, nor ore in sight, but prospective ore, and would only be considered as such by any legitimate mining purchaser. The prospects are entirely favorable that it will go through, but until it is opened on the third side, no one may be sure.

With a profit of .50¢ a ton it is evident that the only way in which interest can be paid upon the present capitalization will be by driving a tunnel from Tide-water some 11,000 feet in length and building a large plant with power equipment thereon. Such a plan calls for an expenditure of at least \$1,200,000.

Following is an estimate of such Equipment:

1. Gastineau Mining Tunnel, 11,000 ft. long, with equipment.....	\$ 450,000
2. 2500-Ton Capacity mill plant, fully equipped, Compressors, etc.....	500,000
3. 2500 H. P. electric development with storage of the Salmon Creek water right.....	300,000
<hr/>	
Total.....	\$1,250,000

In order to raise this sum of money \$1,250,000 of the Bonds of the Alaska Gastineau Mining Company, and the controlling interest of the stock of 51% of the total stock must be available, because those advanc-

ing such a large sum of money as a new investment, all of which money would have to be expended before any returns could be made on it, other than the percentage of earning that would result from the operation of the present milling plant, would look upon the investment from the following point of view:

FIRST:—That the 6% earning on the bonds as a straight investment is not considered a proper rate of interest for a mining investment:

SECOND:—That there is no ore actually blocked out on three sides, and therefore, the only thing that would attract this new money would be the speculative side—that is to say, that besides the fact that the ore above the Alexander Tunnel would more than likely go through, there would, besides this be a large increase of tonnage in the undeveloped portions of the mines. If it were not more than likely that this was the case, it would be impossible to interest substantial money in this investment at all, and it certainly would not pay to attempt to follow out the plan of Colonel Sutherland, of distributing or selling the stock and bonds about the country in small amounts.

THE APEX SITUATION.

Perhaps the most important reason as to why it is necessary at this time that these properties should be consolidated, is the fact that a part of the crop-pings of the ore now developed by the Perseverance mine outcrops on the Ground Hog claim belonging to the Ground Hog group, and by virtue of the United States laws which give the owner of any

claim the right to follow his lode on the dip out of his side lines, it will be necessary, unless these properties are consolidated, to have recourse to the courts, to ascertain just how much of the developed portion of the Perseverance mine belongs to the Ground Hog group.

This apex situation can be seen on your own maps of your property, which plainly show that the dip of the vein as found on the level of the Alexander Crosscut will carry the vein that you are working on that level on its dip, into the Ground Hog claim. Further, the Green Stone foot which you have as a foot wall on the level on the Alexander Tunnel is plainly shown on the Government maps in detail to lie wholly within the Ground Hog claims on the surface. [663]

This condition has never been brought up before because the owners of the Ground Hog group were in legal difficulties until we took it over; but the facts of the case were more or less of common knowledge. Colonel Sutherland was no doubt aware of this claim, but was never in a financial position to take over these properties, though I understand he had planned to do so eventually.

This litigation would no doubt be a very expensive one to all parties concerned, but would have to be fought out nevertheless; and pending the decision of the court, the financing and even the operations of the property would be attended with serious difficulties.

I have made the following table of comparisons of the properties in order to arrange a basis of con-

solidation of these properties owned by the Alaska Gastineau Mining Company and the properties owned by the Alaska Gastineau Mining Company and the properties owned by Mr. Hammon and myself. This comparison is on a saleable basis, as it would be difficult to consider them from any other point of view and both are considered from identically the same basis.

NOTE: It must be understood that this does not mean that these properties could be individually sold for the value set down beside them, but merely at what price they could probably be sold to a purchaser who intended buying the whole of them, and not any individual part, because under the present condition none of them could be sold independent of each other, excepting the Salmon Creek Water Power, the developed electric horse power, Sheep Creek all of which could be operated separately and the Ground Hog group on account of its apex possibilities.

TABLE OF COMPARISON
BETWEEN ALASKA GASTINEAU MINING COMPANY and THE
PROPERTIES OF W. P. HAMMON AND B. L. THANE.
ALASKA GASTINEAU MINING COMPANY:

Mine.	Tons.	Value.
5000 ft. in length on Lode System Ore developed two sides 2000 ft. x 60 ft. wide by 1000 ft. high	10,000,000	
Less 1/3 loss in pillars	3,500,000	
NET ORE	6,500,000	
6,500,000 tons at 50¢ Net Value.....		\$3,250,000.
Less cost of new Equipment necessary to work this profitably.....		1,250,000.
Net Income		\$2,000,000.
Discount 50% because developed only two sides, and on account of apex rights pending to approximately 1/2 this ore.		1,000,000.
NET SALEABLE VALUE		1,000,000.
Estimated Saleable value of 3000 ft. as undeveloped prospect		200,000.
ESTIMATED NET SALEABLE VALUE OF ENTIRE MINE		\$1,200,000.

DEVELOPMENT:—

Cost of development work completed on
property, Alex. Tunnel 2540 ft.

Drifts on	
lode,	2000 "
Upraises,	920 "
General Drf.	2000 "

7460 ft. at \$20. per ft.	150,000.
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100-STAMP & EQUIPMENT:

100 Stamps Mill complete.....	\$125,000
Boarding hse. & Bldg.	10,000
General Equipment	15,000
	<hr/>
	\$150,000..... 150,000.

TOTAL ESTIMATED VALUE OF SALEABLE

PROPERTY	\$1,500,000.
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[664]

NOTE: It must be again noted that this does not mean that this could be sold at that figure, but is the basis of comparison between the properties belonging to your company and our properties, wherein the same basis is used in each instance.

Against this total sum of \$1,500,000 there has been issued First Mortgage Bonds—or will be issued under the agreement—to this full amount.

TABLE OF COMPARISON.

BETWEEN ALASKA GASTINEAU MINING COMPANY and THE
PROPERTIES OF W. P. HAMMON and B. L. THANE.
PROPERTIES OF W. P. HAMMON and B. L. THANE.

MINE:

7,000 ft. in length on Lode System,

(2) GROUND HOG GROUP:

2000 ft. on lode system undeveloped. The
surface indications equal to that of the
Perseverance Mine on one end, Alaska
Juneau on the other.

Saleable Value, Estimated on same basis as
undeveloped portion on Perseverance
Lode\$160,000

Estimated value of Apex Rights, from a sale- able point of view before these rights have been determined by the court.....	250,000	\$ 410,000.
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(b) SHEEP CREEK GROUP:

5,000 ft. on lode, partially developed, several thousand feet drifting, has record gross output of bullion, greater than the Perseverance Mine.

Saleable Value Figured on same basis as undeveloped Portion of Perseverance Mine.

30-Stamp Mill, R. R. Equipment, Tunnels, &c. 330,000
50,000

380,000.

NOTE:—Both the Ground Hog and the Sheep Creek properties, one lying on the North and the other lying on the south end of the Perseverance property, are on the same lode system, and the surface showing in prospective value is equally as great.

WATER RIGHTS:

(a) SALMON CREEK WATER RIGHT:

Situated within two miles of these properties, capably of development by means of storage, of 4,500 electric horse power, all of the year round, 2500 H. P. can be developed throughout the year, at a cost not to exceed \$300,000, Power delivered at the mills. It is the only available water power in this section of the country; all others having been taken up by the Treadwell Co. Without this power the 2500-ton Milling plant at the Beach would have to be run by means of fuel. [665] This cannot be developed under the best conditions for less than \$66. per H. P. per year, which, on this size of milling plant, would mean a cost of .17¢ a ton milled. Our engineers have shown that the Salmon Creek power can develop the same power at a cost of 07¢ per ton of ore milled, making a net savings of 10¢ per ton, which on this sized milling plant would be \$97,000 a year Net saving, so that this water power would be worth at least \$75,000 to accompany operating these properties on a large scale. The net saleable value for other purposes, and this power can be sold after development in this district, I have estimated at \$100,000.....

\$ 100,000.

(b) GRANITE CREEK WATER RIGHTS:

Developed water in Silver Bow Basin adjacent to present 100-Stamp Mill capable of supplying mill with battery water and increased plant also, for at least 10 months in the year. Without this water, present mining plant cannot possibly run for over 4-½ months in the year.

SALEABLE VALUE

50,000.

(c) 300 DEVELOPED ELECTRIC HORSE POWER:

We control 300 Developed Electric Horse power, situated at Sheep Creek and now in operation, to be taken from lines without cost, capable of running

throughout the year, present 100 Stamp Mill, and furnish power to drive Gastineau Tunnel. The value to the property, easy, \$250,000. Earning capacity at present time at rate of \$40. per H. P. per year, \$12,000 per annum. We have offers for this power at the present time from outside concerns. This property has a cash value of.....

\$ 130,000.

SILVER BOW BASIN PLACER & DUMP:

Saleable value for placer and dumping purposes for Perseverance Mill.....

50,000.

TOTAL VALUE OF HAMMON-THANE HOLDINGS, Figured on the same Basis as the Alaska Gastineau Mining Company property

\$1,100,000.

NOTE: Maps and reports covering all these properties, showing the situation, &c., as Colonel Sutherland had planned to eventually take them in, are in the offices of your companies. In fact he had made several moves in that direction, but was unable to accomplish it, on account of financial difficulties. I have maps, reports and data covering all of these properties and also the facts covering the apex situation, which I shall be glad to exhibit.

In sizing up these two holdings for the purpose of consolidation it can be readily seen that on account of the greater length of lode held by the Ground Hog and the Sheep Creek properties, the prospective value of these areas is equally as great, in fact, greater than that of the Perseverance Mines, and that value is equally assured from the position which they occupy and from the developed work already done upon them. Further, the water power, developed undeveloped which we hold would fully offset the present equipment and development practically on an equal basis. [666]

On your part it will be impossible to finance and equip your properties on a paying basis, without eliminating the apex rights we hold and taking over

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our water power. Although we can develop the Sheep Creek properties from the Sheep Creek Basin, it would be to our advantage to have this consolidation occur at once, so that our property would be properly opened up at the start.

GENERAL PLAN OF CONSOLIDATION.

Considering the Alaska Gastineau Mining Company, as the basis of organization, we have the following:

CAPITALIZATION OF COMPANY:

7,000 Bonds, Par Value \$500, bearing interest at the rate of 6%	\$ 3,500,000
2,400,000 shares of stock, Par value \$5.....	12,000,000

PROPOSED DISTRIBUTION:

	BONDS—%		STOCK—%	
FIRST: In exchange for Perseverance properties and in liquidation of all debts, secured and unsecured against these properties, and the holders of stock and debentures there- of	\$ 1,500,000	42.85%	\$ 1,800,000	15%
SECOND: In exchange for Hammon-Thane holdings, as shown in the above comparison, to prevent further litigation and place the properties where they can be properly financed	750,000	21.42%	\$ 4,080,000	34%
THIRD: For the purpose of raising new money for driving the big tunnel, building large mill- ing plant, power &c. as out- lined previously in this letter	\$ 1,250,000	35.72%	\$ 6,120,000	51%
	\$ 3,500,000	100%	\$12,000,000	100%

NOTE: Our properties should properly go in on the same basis with the Perseverance properties, as previously shown in the comparison, but inasmuch as there has already been issued \$1,500,000 of bonds for your properties, which cannot very well be changed, on account of the indebtedness existing against the properties to approximately that amount, and as there will have to be \$1,250,000 Bonds left to raise the new money, there is only 750,000 Bonds available for these new properties, and in consequence, the difference will have to be made up in stock, as is shown in the above plan.

To recapitulate, this would mean that the present holders of stock and bonds, debts, &c., in the companies now merged into the Alaska Gastineau Mining Company would exchange their holdings for \$1,500,000 of bonds and \$1,800,000 of the stock of the Alaska Gastineau Mining Company after merger of our properties, and that \$750,000 of Bonds and \$4,080,000 of stock of that company would be put up in the escrow to be exchanged for the properties belonging to Hammon and Thane.

Further, Hammon and Thane would require an option on \$1,250,000 of the Bonds and \$6,120,000 or 51% of the stock of the company for the purpose of raising \$1,250,000 to go into the treasury of the company to build a larger milling equipment, power plant and driving the big tunnel. These shares and bonds to be placed in escrow to be exchanged for moneys at the face value of bonds, with its proportionate share of stock. The option to extend from the time stock and bonds were placed in escrow, for a period of four years. The money to be [667] raised as needed for the work outlined.

And further during the time of this option, the holders of this option should have the management of the property by agreement, Mr. Hammon's ability to finance and operate these properties can easily be ascertained. The fact of our exchanging our unencumbered interests for stock and bonds of the company would necessitate the raising of this money before our own properties could be developed; which would show good faith.

In order to carry this out, it will be necessary to

obtain the consent of the bond holders and stockholders of the Alaska Gastineau Mining Company; and also the agreement of those holding securities for money advanced to Sutherland; and lastly, the unsecured creditors of the Sutherland estate. It will also be necessary for these various interests mentioned above to appoint a committee, turning over to this committee all of their securities, whether it be in the form of stock and bonds, or in notes, empowering this committee to deal with the Sutherland estate so that a settlement can be made with that estate, and generally empowering the committee to take such proceedings and exercise all the rights of ownership in the securities as may be necessary to effectuate the purpose of this plan.

Unless some such plan as this is carried out, it seems to me that the holders of stock and bonds in the Sutherland companies will stand to lose everything that they have put in, as it is plain to be seen that every creditor of whatever nature is bound to fight out the limit of his particular interest. And even when it was settled, provided it should be, the new owners of the properties would have to fight out the apex situation before they could continue. The thing resolves itself into an arrangement whereby the present security holders and leading stock and bond holders of the Sutherland company will get together and protect themselves the best they can, wherein each and every one will have to abide by a definite plan; and in order to make the best out of what would otherwise prove a disastrous situation.

The following table will show a list of the holders

of Bonds now issued; number of bonds held by each; now held; money loaned estate, and (approximate) new distribution to be made by the committee of the Bonds now held as security and those held by the estate, amongst those who loaned money to the estate:—

TABLE.

Name.	No. Blds.	Now Held.	Money loaned estate.	New Distr. Bds. to be made by Committee after settle't with estate.
HAZELTIME-POWER CO.	269	As Security	\$115,000	230
Barlow	147			
Laurie	122			
B'k British N. America	210	"	75,000	150
Sir WM. MARLING	650	"	160,000	320
Sir JAS. McGRIGOR & ED. A. BLISS	211	"	50,000	100
W. J. SUTHERLAND (Estate)	621	In Estate	—	—
F. P. GROWTHER	9	Owne'd outr't	—	-9
GEORGE GROWTHER	10	" "	—	10
J. J. REID	10	" "	—	10
MRS. AGNES SUTHERLAND	10	" "	—	10
J. T. GILBERT	—	—	612,000	1224
J. T. GILBERT	1000 1000	To accept for pay- ment mine \$200,- 000 with \$120,000 interest Ten (10) year.		640
TOTALS,	3,000		\$1,021,000	2703

As shown from the above balance of bonds left in the hands of the Committee after distribution, would be 3000 less 2703, or 297 Bonds par value \$148,500, being used by the committee to take care of small creditors, such as Laffoon, C. H. Pierce and others. Any bonds left over after this, to be distributed amongst the present security holders. [668]

The only bond holders affected by this distribution are Hazeltine-Power & Co., Bank of British North

America, Sir. Wm. Marling, J. T. Gilbert, Sir James McGrigor and the Sutherland Estate.

Therefore, they would have to agree to this plan first, and by pooling their interests with the committee settle with the estate, balancing the debts of the estate and with the estate, obtaining the bonds and stock left in the estate, in payment thereof.

The rest of the bond holders shown in the list will have to agree to this plan in order to allow the committee to change mortgage so that the 700,000 shares of stock left in the treasury of the company for purposes of exchange would be liberated to carry out this plan.

NOTE: The present security holders, in agreeing to the above reduction of their bonds in the new distribution by the committee, must remember that they will be receiving twice the security they now have by the addition of new property, essential water power, freedom of litigation, and particularly the assurance of the properties being financed, so that their bonds would be put on a paying basis and have a real value which at present they do not have, as under the existing conditions they property cannot pay interest on them.

The following table will show a list of holders of shares now issued; number of shares held by each; now held, and new distribution to be made thereof by the committee in order to carry out this plan.

TABLE.

Distribution by Committee.

Name.	No. Shares Par Value.	Held as Security.	Owued Outright.	Shares lib- erated to carry out plan.	Shares owned outright left after liberat- ing $\frac{1}{2}$ to carry out plan.
HAZELTINE-POWER					
CO. Barlow	96,850	62,277	150,298	62,277	73,149
Laurie & Barl	27,000				
E. Hazel- time	41,725				
Laurie	47,000	212,575			
B'k. B. N. America	25,000	25,000		25,000	
Golby & Nott					
SIR WM. MARLIN	94,446	94,446		94,446	
SIR. JAS. McGRIGOR	62,259	62,259		62,259	
R. F. LAFFOON	2,000		2,000		1,000
SIR J. T. BRUNNER	53,333		53,333		26,666
E. P. CROWTHER	14,100		14,100		7,050
NEW CITY FIN. ASSN.	13,334		13,334		6,667
MRS. AGNES SUTHER- LAND	217,648		217,648		108,824
SUTHERLAND ESTATE	254,426		254,426	254,426	
T. H. BERRIDGE	12,055		12,055		6,028
R. L. GLASHEN	20,000		20,000		10,000
SMALL SHAREHOLDERS	118,824		118,824		59,412
TOTALS	\$1,100,000	243,982	856,018	498,408	300,796

From the above list may be seen in column 4, that the 498,408 shares now held as security by the Estate will have to be liberated to carry out plan of new consolidation. The security holders have sufficient bonds to protect them for the money.

In the 5th column may be seen that the present owners outright of stock would have to reduce their holdings one-half in order to carry out the plan. They should be willing to do this, inasmuch as they would be receiving in return twice the security in new property.

Essential water power, freedom from litigation and

the assurance of money necessary to finance the property, which would give the stock a real value, which it has not now. [669]

Under this plan the committee would have 15% of the capital stock of the company, or 360,000 shares, par value \$1,600,000 to carry this out. 360,000 shares, less 300,796 shares (see column 5) would leave a balance of 59,215 shares, par value \$298,875, in the hands of the committee to be used by them as may be deemed necessary.

RECAPITULATION.

The consenting stock and bond holders will voluntarily form a committee empowered to carry out this plan.

Each and every one of the security holders, secured and unsecured or owners outright, will turn over to this committee all of their stock and bonds, with a statement of the money loaned to Colonel Sutherland, receiving a receipt for the same, with the understanding that this committee will then proceed to arrange with the trustees of the estate after the will is probated, to settle with the estate on the following basis.

1. The creditors of the state to accept the stock and bonds now held as security, in payment for their loans, and this stock and bonds to be reapportioned by the committee.

2. The balance of the bonds and stock remaining in the Sutherland estate to be assigned to Mr. Gilbert and to be accepted by him in full payment of his claim against the estate for moneys advanced to the amount of \$612,000, the effect of which would be to

eliminate the indebtedness of the companies to the estate.

The trustees of the estate would no doubt be glad to agree to this plan, inasmuch as it now stands, the stock and bonds have no cash value whatsoever, and I understand there is no cash in the estate to settle its accounts, nor is there any cash in the treasury of the mining company to make payments to the estate. I also understand that the desire of the heirs to the estate is to see that this is settled along these lines, so that the estate can be closed with honor, even if there is nothing left of it;

3. This committee will then proceed to obtain the consent of the balance of the small bond holders to this plan, and also all of the stockholders with whom it can get in touch;

4. The committee, after it had obtained the consent of all of the bonds to this plan, and by virtue of the control of the stock likewise, would pass a resolution changing the terms of the present mortgage against the Alaska Gastineau Mining Company in this particular, that the 700,000 shares of stock now set aside to be exchanged for the full issue of bonds as described in the mortgage should be liberated to be used for other purposes as outlined, in the plan—that is to say: to take over the new properties and help raise new money. An arrangement could be made later on in the company's affairs to look after such an exchange. It is not necessary to do so at this time, as the stock can have no earning power value for some three or four years to come, and there is not enough stock left in the treasury to accomplish the deal.

5. The committee would then place in escrow, as outlined in the plan, \$750,000 par value of bonds, or 21.43% of the bond issue, and \$4,080,000 par value of the stock or 34% of the stock issue to be exchanged for the Thane-Hammon interests.

And would also place in escrow \$1,250,000 or 35.72% of the bond issue and \$6,120,000 or 15% of the stock issue, to be exchanged for \$1,250,000 or new money to go into the treasury of the company to be used to equip the property with the 2500-ton plant, drive the big tunnel, and develop the power; and give a 4-year option to Hammon and Thane on these bonds and stock to be exchanged for money at the face value of the bonds and its proportionate share of stock as raised by them for the above purpose; the money to be raised as rapidly as need; the option to extend from the time the bonds and stock were placed in escrow. [670]

Any of the present bond or stockholders desiring to purchase bonds or stock set aside to raise the new money, could do so by arranging with the holders of this option, and by agreeing to pool their interests with them so that the new money would retain control, during its expenditure.

There will be two original copies made by this plan, both of which will be signed by all of the necessary interested parties. One of these will be the property of the Committee, and the other of Hammon and Thane. Copies of this letter and plan will be given to each and everyone signing the agreement.

I have gone into this subject at length, on account of the extremely complicated condition of affairs as

left by W. J. Sutherland, and because it is necessary that each and every interested party have a thorough understanding of the situation, to prevent loss of time in carrying out the plans.

I have been operating mines in Alaska, in the same district the Perseverance Mines are in, for the last ten years, and feel that I know the general situation quite as well as anybody could, and after studying the condition this company is now in, I am personally convinced that this plan offers the only feasible way in which these properties can go forward to a successful end, wherein the present creditors of the company will have an opportunity of getting back their money with interest.

It will be necessary for each and every interested party connected with this plan to act in good faith and do their utmost to bring it about, in order that a successful conclusion may be reached.

I feel sure that unless this plan is carried out, and that each and every creditor of the Sutherland estate attempts to protect himself individually, that the whole property will go to pieces and be the subject of litigation for years to come, as this has been the history of our Alaska courts and the ruin of many a good proposition up there.

If it were not for this phase of the situation, I am sure that Mr. Hammon would feel as I do, that it would not be advisable for us to enter this deal on the terms we have outlined herein.

On our part, if this plan is carried out, we will immediately proceed to utilize the 300 Developed Electric Horst Power, in conjunction with the Granite

Creek water rights, so that the present mill on the property could be kept going for at least ten months in the year, and be in a position to commence paying interest on the present indebtedness. We would meanwhile finish the engineering plans preparatory to driving the big tunnel, develop the Salmon Creek power and building the new mill, and at the same time arrange for the necessary new money to carry this out.

Our good faith would be shown in our turning our properties into this consolidation, as that would necessitate our raising the money before we could realize on them ourselves.

In conclusion, the various parties interested in these mines, by entering this plan, should take into consideration the fact that any reduction made in their present holdings by the committee is more than made up by the fact that they will have twice the security they formerly had, by the addition of the new properties, by the freedom from future litigation, by the acquisition of water power absolutely essential for the success of these mines, and most important of all, by the assurance that the properties will be properly financed, so that the present securities will soon have a real value.

I will proceed to take this matter up with the various interests named in the last list, and if they all agree, will then leave it to them to appoint their committee to carry out the terms of this plan.

Trusting that this will meet with the approval of all concerned, and that it will be the start of a new

and legitimate enterprise, established on a sound basis, I am

Respectfully yours, [671]

(Following is a letter of acceptance, with signatures of the Debenture Holders and stock holders necessary to the foregoing plan.)

New York, June 12, 1912.

Messrs. W. P. Hammon and B. L. Thane,
San Francisco, Calif.

Gentlemen:—

I have read the foregoing letter with outlined plan for consolidation and reconstruction of the Alaska Gastineau Mining Company and your properties, and hereby agree to this plan and its terms thereof.

I will turn over my securities, with statements of my account, if any, to the Bank of British North America, to be used by the Committee in carrying out this plan.

I will also use my efforts to have this committee appointed immediately and see that the terms of this plan are carried out as rapidly as practicable.

I further assure you of my good faith, and that I will do my utmost to assist in bringing this arrangement about, and will abide absolutely by the decisions of the committee.

Yours truly, [672]

[**Exhibit "C"—Attached to Deposition of F. W. Bradley.**]

Copy—Exhibit "C"

San Francisco, Cal., October 31, 1910.

Professor C. L. Cory,
Union Trust Building,
San Francisco.

My dear Professor:

The Alaska Treadwell and allied companies have leased a water power property to which they have added other property of their own and have since developed and equipped the whole with a generating plant and are now transmitting 2000 K.W. from this plant to their mines.

The lessor or owner of a portion of the water power property interpret the lease as follows:

"That he has the option to either take 300 electric horse power from and at our generating plant, or else to accept the sum of \$25,000.00 in complete payment for his property."

The lessor construing the lease in this way, believes that the 300 electric horse-power from and at the generating plant is of greater value than the sum of \$25,000.00. Assuming that the lessor has the right to take 300 electric horse-power from and at the generating plant subject to all operating and physical conditions beyond our control, I wish your opinion as to the present cash value of the same under the following conditions:

First: The total cost of the above hydro-electric 2000 K.W. plant with electric power delivered at the

mines seven to eight months per year has amounted to \$50. per horse-power.

Second: During the seven to eight months each year there is more than sufficient water to run the plant to full capacity. During the remaining four or five months there will not be enough water to make the full 300 electric horse-power. That is, for at least four months each year, the plant may not be able to average over 100 electric horse-power—this is a physical cause beyond our [673] control.

Third: We have built a 2000 K.W. steam electric relay plant at a capital cost of \$50.00 per horse-power. With fuel oil delivered at 90¢ per barrel, we estimate that the total operating cost of this steam relay plant will not exceed \$35.00 per horse-power per year.

Fourth: We are developing another water-power which we own outright and will provide it with ample storage so as to have an *al-the-year-round* power. The capital cost of this plant delivering electric power at the mines twelve months per year will be about \$135.00 per horse-power.

Fifth: We will still need power in addition to what all the foregoing installations will provide, but can secure it by slightly increasing the capacity of any of the above-mentioned plants.

If the lessor is right in his contention that he can demand the 300 electric horse-power at the generating plant and sell it to the highest bidder, what price in your opinion would we be justified in offering him for it: You must consider that if this 300 electric horse-power is sold to any outsider, the outsider will

have to build his own transmission line four miles to the nearest market, the power will only be good eight months per year and his peak loads cannot exceed 300 electric horse-power at the generating plant.

Yours very truly,

F. W. BRADLEY. [674]

[Exhibit "C-1"—Attached to Deposition of F. W. Bradley.]

(Copy) San Francisco, Cal., Dec. 13, 1910.

Prof. C. L. Cory,

804 Union Trust Bldg.,

San Francisco.

My dear Professor:

I have just returned from a month's absence and this is the first opportunity I have had to more thoroughly study your letter of 7th ult. replying to my letter of Oct. 31st last regarding the Alaska Treadwell Mining Co. and a leased water power.

I wish you would write me further regarding the matter after taking into consideration the following additional factors:

First. *Power to be sold by Lessor to Municipality;*

This field (Douglas 2,000 people, 4 miles from Juneau, and Juneau 1,500 people, 4 miles from source of power) is already fully occupied and no outsider could enter and compete without furnishing a uniformly constant service the year round at a lower rate and the most he could expect would be but a portion of the business.

The lessor or owner of the 300 Horse Power would in addition to the eight-mile transmission line (four miles to Juneau and four miles further to Douglas)

have to install a steam relay plant, complete distributing system for both towns, and also step-up and step-down transformers, as he would be entitled only to the generated voltage at the generating plant. The lessor would also have to keep three men at the circuit-breaker (one man eight-hour shift at \$3.00 per shift) to close the circuit whenever any peak might happen to open it.

Second. *Power to be sold by lessor to other mining companies with 10 mile transmission.*

The mines that this ten mile transmission line would reach now have a working season but five months long, but during [675] such season they have plenty of water power for all purposes. The lessor's 300 horse power with steam relay addition could supply the mines with an addition seven months of power, or without the steam plant, with an additional three months of power. This 300 Horse Power less the transformer and line losses would be of sufficient amount to be of decided advantage to a certain mine ten miles away, either for the additional three or seven months per year.

Third. *The value or equivalent cost to your companies of such power generated by steam.*

You must consider that in our own case we have a surplus of water five months per year. Therefore the lessor's 300 Horse-Power minus would be of use to us only three months per year and his 100 Horse Power minus four months per year.

Fourth. *The value or equivalent cost to your companies of such power generated from larger water power plants.*

Our storage hydro-electric plant will be for 3,000 Horse Power. 300 Horse Power is such a small percentage on top of this that I do not think it fair to charge up against it the \$135 first cost that the 300 H. P. plant is costing. That is, the hydraulic development for 3,000 Horse Power would almost answer for 3,300, Horse Power. Also as remarked above, we have all the water power we want for five months per year and the lessor's 300 Horse Power minus would be useful only three months per year, and his 100 Horse Power minus would be of use to us only four months per year.

Yours very truly,
F. W. BRADLEY. [676]

Exhibit "C-2" [Attached to Deposition of F. W. Bradley].

(Copy) San Francisco, Cal., Dec. 14, 1910.
L. P. Shackleford, Esq.,
C/o Palace Hotel,
San Francisco.

Dear Mr. Shackleford:

Referring to my letter of Oct. 31st last to Prof. Cory, copy of which I handed you at your request, I herewith hand you copy of my letter of yesterday to him.

Yours very truly,
F. W. BRADLEY.

1 Enc. [677]

[Exhibit "D"—Attached to Deposition of F. W. Bradley.]

THIS INDENTURE AND AGREEMENT made and entered into this 14th day of October, 1909, by and between OXFORD MINING COMPANY hereinafter called the lessor and the Alaska Treadwell Gold Mining Company, the Alaska Mexican Gold Mining Company and the Alaska United Gold Mining Company hereinafter called the lessees.

WITNESSETH,—First, the lessor has this date and does by these presents lease unto the lessees all of the following described real property situated on and near Sheep Creek in the Harris Mining District, District of Alaska to wit:

The Mexico Mill-site U. S. Mineral Entry No. 25, lot 71B. The Bellvidere Mill-site U. S. Mineral Entry No. 25, lot 72B. The Jumbo Mill-site U. S. Mineral Entry No. 60, lot No. 260. Also that certain piece or parcel of land beginning at a stake identical with post No. 2 Jumbo Mill-site U. S. Survey No. 260 on the meander line of Gastineau Channel, thence first course along the meander line of Gastineau Channel at ordinary high water mark N. 52.00' W. 54 feet to stake No. 2; thence second course N. 48° 15' E. 200 feet to stake No. 3; thence S. 52.00' E. 54 feet to the N. W. side line of Jumbo Mill-site U. S. Survey No. 260 to stake No. 4; thence S. 46 15' West along the Northwest side line Jumbo Mill-site U. S. Survey No. 260, 200 feet to stake No. 1, the place of beginning containing an area of one quarter of an acre more or less courses expressed from the true meridian, Mag. Var. 29.30'; and also that certain

water right known as the Sheep Creek Water Right and located on Sheep Creek about three quarters of a mile from its mouth, together with the flume and pipe line connecting the same with the beach near the mill at the mouth of the said Sheep Creek, also the saw-mill, penstocks, waterwheels, and all other machinery and appliances used in connection with said saw-mill, situated near the mouth of said Sheep Creek, together with all machinery, tools equipment, plants of every kind and description now upon said property for a term of ten (10) years from the date hereof at a monthly [678] rental of One Hundred and Twenty-five (\$125.00) dollars per month, payable in gold coin of the United States on the first day of each month during the term of said lease at the office of the lessees at Treadwell, Alaska; and it is hereby agreed, that if any rent shall be due and unpaid, or if default shall be made in any of the covenants herein contained, that it shall be lawful for the lessor to re-enter said premises and remove all persons therefrom, and the lessees do hereby covenant, promise and agree to pay the lessor the said rent in the manner hereinbefore specified, and not to let or underlet the whole or any part of said premises without a written consent of the lessor, nor to assign this lease or any part thereof without said written consent, and at the expiration of said term the party of the second part will quit and surrender said premises in as good state and condition as the same are now.

It is the intention of the Lessees to erect, equip and maintain upon said premises a water power plant of substantial size and efficiency for the generation of

electric power, and if at any time after two (2) years from the date hereof the lessor or its assigns shall elect to take a current of not to exceed three hundred (300) electric horse-power which shall be taken from and at the generating plant to be installed upon the leased premises hereinbefore described, the lessees undertake covenant and agree to deliver said current to the lessor or its assigns upon the execution and delivery by the lessor or its assigns to the lessee of a deed or deeds conveying said leased property herein described to the party of the second part. If prior to the expiration of nine years from the date hereof the lessor does not elect to convey to lessees or their assigns the property herein leased and accept in full consideration therefor the right to the use of the three hundred (300) electric horse-power hereinbefore mentioned, the lessees may at their option prior to the expiration of the ten (10) years provided in this lease purchase the property leased absolutely from [679] the lessor by paying to the lessor the sum of Twenty-five Thousand dollars (25,000.) in gold coin of the United States; and the lessor covenants and agrees upon tender of said sum of Twenty-five Thousand Dollars (\$25,000.) to execute and deliver such deeds of conveyance to the property herein leased as hereinbefore specified, excepting only as to the title to (1) the one quarter acre tract hereinbefore described and (2) the premises occupied and used by the existing wharf to the lessor to both of which the lessor now asserts only possessory titles. The lessees may at their own cost and expense undertake to perfect the said titles and should lessee wish

so to do the lessor shall lend all proper assistance in its power including the using of its name, and should the said titles be so perfected to the said premises or either of them they shall become the property of the lessor and remain covered by this lease and subject to all terms and conditions thereof.

The covenants herein contained shall be construed as running with the land and as a charge thereon, so, that any successor or successors in interest to the lessor and or lessees who may acquire any interest in and to the titles to the said land shall be bound by this conveyance in the same manner as if they had executed this agreement; and the lessees hereof may require at their option that the property herein described be conveyed by the lessor to a responsible Trustee for the purpose of carrying out the terms of this agreement, or that deeds and conveyances covering the property herein leased be placed in escrow so as to insure delivery of the same if required under the provisions of any of the covenants of this lease.

If neither of the options herein provided for are accepted by either the lessor or lessees then the property and rights herein described with all the improvements that are or that may hereafter be placed on the said premises shall be and become the property of the lessor. [680]

The provisions herein as to the delivery of three hundred (300) horse-power at the generating plant to be installed on the premises herein described contemplates the delivery of an uninterrupted current, but the lessees shall not be liable for damages that may arise from operating and physical causes beyond its control.

IN WITNESS WHEREOF the parties hereto have hereunto set their hands and seals the day and year first above written. (Executed in triplicate.)

Witness:

HAROLD LAWRENCE.

WALTER W. BLACK.

OXFORD MINING COMPANY.

By WALLACE HACKETT,
President.

And HENRY ENDICOTT,
Treasurer.

[Seal Oxford Mining Company]

ALASKA TREADWELL GOLD MINING
COMPANY.

By H. H. TAYLOR,
President.

F. A. HAMMERSMITH,
Secretary.

ALASKA MEXICAN GOLD MINING
COMPANY.

By H. H. TAYLOR,
President.

F. A. HAMMERSMITH,
Secretary.

ALASKA UNITED GOLD MINING COM-
PANY.

By H. H. TAYLOR,
President.

F. A. HAMMERSMITH,
Secretary.

[Seal Alaska Treadwell Gold Mining Co.]

[Seal Alaska Mexican Gold Mining Co.]

[Seal Alaska United Gold Mining Co.]

COMMONWEALTH OF MASSACHUSETTS,
COUNTY OF SUFFOLK,
CITY OF BOSTON,—ss.

Be it remembered that on this 14th day of October, 1909, before me, the undersigned, a Notary Public, in and for said County and State, personally appeared Wallace Hackett, President, and Henry Endicott, Treasurer, of the Oxford Mining Company, a corporation organized [681] under the laws of the State of Maine, to me known to be the individuals described in and who executed the foregoing instrument as such President and Treasurer; and said Henry Endicott having affixed the seal of said Corporation to said instrument they severally acknowledged to me that he, Wallace Hackett, as President, and he, Henry Endicott, as Treasurer of said Corporation executed the foregoing instrument for and on behalf of said Corporation, as the free and voluntary act of said Corporation for the uses and purpose therein set forth. The *the* said Henry Endicott, being by me first duly sworn, on his oath states that he is the Treasurer of said Corporation, is acquainted and is the custodian, and has in his possession the corporate seal of said Corporation and that the seal hereinbefore affixed is the corporate seal of said Corporation and was affixed by him as such Treasurer by order of the Board of Directors of said Corporation.

In Witness Whereof I have hereunto set my hand

and seal the date and year first above written.

[Notorial Seal]

(Signed) LLOYD A. FROST,
Notary Public.

My commission expires Dec. 5th, 1913.

STATE OF CALIFORNIA,

CITY AND COUNTY OF SAN FRANCISCO,—ss.

On this 12th day of November in the year one thousand nine hundred and nine, before me, P. J. Kennedy, a Notary Public, in and for said City and County, residing therein, duly commissioned and sworn, personally appeared H. H. Taylor, and F. A. Hammersmith, known to me to be the President and Secretary respectively of Alaska Mexican Gold Mining Company and Alaska United Gold Mining Company, the corporations that executed the within and foregoing instrument and to be the officers who executed the said instrument on behalf of said corporations therein named, and they acknowledged to me that such corporations executed the same.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal at my office in the said City and County of San Francisco, the day and year last above written.

[Notarial Seal]

(Signed) P. J. KENNEDY,
Notary Public in and for the City and County of San
Francisco, State of California.

State of California,

City and County of San Francisco,—ss.

On this 12th day of November, in the year One

Thousand Nine Hundred and Nine, before me, P. J. Kennedy, a Notary Public, in and for said City and County, residing therein, duly commissioned and sworn, personally appeared H. H. Taylor and F. A. Hammersmith, known to me to be the President and Secretary, respectively, of Alaska Treadwell Gold Mining Company, the Corporation that executed the within and foregoing instrument, and to be the officers who executed the said instrument on behalf of said Corporation therein named, and they acknowledged to me that such Corporation executed the same.

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal at my office in said City and County of San Francisco, the day and year last above written.

[Notarial Seal]

(Signed) P. J. KENNEDY,

Notary Public in and for the City and County of San Francisco, State of California. [682]

CERTIFIED COPY OF RESOLUTION PASSED
BY THE BOARD OF DIRECTORS OF
ALASKA TREADWELL GOLD MINING
COMPANY.

“Resolved that the proposed lease, dated October 14, 1909, of certain real property particularly therein described and situated on and near Sheep Creek in the Harris Mining District, Alaska, made by and between Oxford Mining Company and Alaska Treadwell Gold Mining Company, Alaska Mexican Gold Mining Company and Alaska United Gold Mining Company, be and the same is hereby approved and accepted and the President and Secretary are hereby

authorized and directed, in the name of the Company and as its act and deed and under its corporate seal, to execute and deliver said lease to Oxford Mining Company.”

CERTIFICATE OF SECRETARY.

I, F. A. Hammersmith, hereby certify that I am the Secretary of Alaska Treadwell Gold Mining Company; that the foregoing Resolution is a full, true and correct copy of a Resolution duly passed and adopted by the Board of Directors of said Company at a meeting held on the 11th day of November, 1909, as the same is now recorded on the minutes of the meeting of said Board of Directors.

In Witness Whereof I have hereunto set my hand as such Secretary and affixed the corporate seal of said Company, this 11th day of November, 1909.

[Corporate Seal]

(Signed) F. A. HAMMERSMITH,
Secretary of Alaska Treadwell Gold Mining Company.

CERTIFIED COPY OF RESOLUTION PASSED BY THE BOARD OF DIRECTORS OF ALASKA MEXICAN GOLD MINING COM- PANY.

“Resolved that the proposed lease dated October 14th, 1909, of certain real property particularly therein described and situated on and near Sheep Creek in the Harris Mining District, Alaska, made by and between Oxford Mining Company and Alaska Treadwell Gold Mining Company, Alaska Mexican Gold Mining Company and Alaska United Gold Min-

ing Company, be and the same is hereby approved and accepted and the President and Secretary are hereby authorized and directed, in the name of the Company and as its act and deed and under its corporate seal, to execute and deliver said lease to Oxford Mining Company."

CERTIFICATE OF SECRETARY.

I, F. A. Hammersmith, hereby certify that I am the Secretary of the Alaska Mexican Gold Mining Company; that the foregoing resolution is a full, true and correct copy of the Resolution duly passed and adopted by the Board of Directors of said Company at a meeting held on the 11th day of November, 1909, as the same is now recorded on the minutes of the meeting of said Board of Directors.

In Witness Whereof I have hereunto set my hand as such Secretary and affixed the corporate seal of said Company, this 11th day of November, 1909.

[Corporate Seal]

(Signed) F. A. HAMMERSMITH,
Secretary of Alaska Mexican Gold Mining Company. [683]

"Resolved that the proposed lease, dated October 14th, 1909, of certain real property particularly therein described and situated on and near Sheep Creek in the Harris Mining District, Alaska, made by and between the Oxford Mining Company and Alaska Treadwell Gold Mining Company, Alaska Mexican Gold Mining Company and Alaska United Gold Mining Company, be and the same is hereby approved and accepted and the President and Secretary are hereby authorized and directed, in the name

of the company and as its act and deed and under its corporate seal, to execute and deliver said lease to Oxford Mining Company.”

CERTIFICATE OF SECRETARY.

I, F. A. Hammersmith, hereby certify that I am the Secretary of Alaska United Gold Mining Company; that the foregoing Resolution is a full, true and correct copy of a Resolution duly passed and adopted by the Board of Directors of said Company at a meeting held on the 11th day of November, 1909, as the same is now recorded on the minutes of the meeting of said Board of Directors.

In Witness Whereof I have hereunto set my hand as such Secretary and affixed the corporate seal of said Company, this 11th day of November, 1909.

[Corporate Seal]

(Signed) F. A. HAMMERSMITH,
Secretary of Alaska United Gold Mining Company.

**COMMONWEALTH OF MASSACHUSETTS,
COUNTY OF SUFFOLK,
CITY OF BOSTON,—ss.**

WHEREAS the International Trust Company, a corporation, has reserved unto itself for the benefit of itself and various persons therein interested a lien upon the property described in the foregoing lease for the sum of \$36,376, to secure the costs, advances, and charges in connection with the foreclosure of certain trust deeds upon certain property in the District of Alaska, a part of which is described in the foregoing instrument.

NOW, THEREFORE, THIS INSTRUMENT

WITNESSETH that in consideration of the covenants contained in the foregoing agreement said International Trust Company for the purpose of binding the interest so held upon said property by said lien, assents, agrees and ratifies the execution of the foregoing lease with the Alaska Treadwell Gold Mining Company et al. party of the second part, and agrees to substitute said lien upon any contract or contracts which may be made pursuant to the options contained in the said lease, so that the terms and provisions of said contract may be carried out.

Executed in triplicate.

Signed this 14th day of October, 1909.

INTERNATIONAL TRUST COMPANY.

By JNO. M. GRAHAM,

Pres.

[Corporate Seal] HENRY L. JEWETT,

Sect.

Witness:

WALTER W. BLACK.

HAROLD LAWRENCE.

COMMONWEALTH OF MASSACHUSETTS,
COUNTY OF SUFFOLK,
CITY OF BOSTON,—ss.

Be it remembered that on the 14th day of October, 1909, before me, the undersigned Notary Public, in and for said County and State, [684] personally appeared John M. Graham, President, and Henry L. Jewett, Secretary of the International Trust Company, a corporation organized under the laws of the State of Massachusetts, to me known to be the individuals described in and who executed the foregoing

instrument, as such President and Secretary for and on behalf of said International Trust Company as Trustee for the mortgage bondholders under said instrument described; the said Henry L. Jewett having affixed the seal of said corporation to said instrument and they severally acknowledged to me that he, John M. Graham as President, and he, the said Henry L. Jewett, as Secretary of said Corporation, executed the foregoing instrument for and on behalf of said Corporation as the free and voluntary act and deed of said Corporation as Trustee for the uses and purposes therein set forth.

Then the said Henry L. Jewett being by me first duly sworn on his oath states that he is the Secretary of said Corporation, is acquainted, is the custodian, and has in his possession the corporate *sel* of said Corporation and that the seal hereinbefore affixed is the corporate seal of said corporation and *was by* him as such Secretary by order of the Board of Directors of said Corporation.

IN WITNESS WHEREOF I have hereunto set my hand and affixed official seal the day and year first above written.

[Notarial Seal]

(Signed) LLOYD A. FROST,
Notary Public.

My commission expires Dec. 5, 1913.

COMMONWEALTH OF MASSACHUSETTS,
COUNTY OF SUFFOLK,
CITY OF BOSTON,—ss.

WHEREAS the International Trust Company, a corporation, has reserved a lien upon the property

750 *Alaska Treadwell Gold Mining Co. et al.*

described in the foregoing lease together with other property.

Now for the purpose of further securing said lien, the undersigned lessor in the following instrument, by order of its Board of Directors, hereby assigns the rentals due or to become due under the foregoing lease to the International Trust Company to be applied, first upon the payment of interest on the \$15,000, item of compensation reserved in favor of said Trust Company at the rate of six per cent (6%) per annum, and second that the balance of said moneys be applied pro rata upon the other items described in said lien so reserved.

Dated this 14th day of October, 1909, at Boston, Mass.

(Signed) OXFORD MINING COMPANY.

By WALLACE HACKETT,

President.

Attest: HENRY ENDICOTT, Secretary. [685]

[Exhibit "E"—Attached to Deposition of F. W. Bradley.]

THIS INDENTURE, made this 22nd day of April, 1911, BETWEEN the Oxford Mining Company, a corporation, hereinafter called the party of the first part, and the Alaska Treadwell Gold Mining Company, a corporation, the Alaska Mexican Gold Mining Company, a corporation, and the Alaska United Gold Mining Company, a corporation, hereinafter called the parties of the second part, WITNESSETH;

THAT WHEREAS, on the 14th day of October,

1909, the parties of the first and second parts above mentioned, entered into an indenture and agreement in words and figures as follows, to wit:

THIS INDENTURE AND AGREEMENT made and entered into this 14th day of October, 1909, by and between OXFORD MINING COMPANY hereinafter called the lessor and the Alaska Treadwell Gold Mining Company, the Alaska Mexican Gold Mining Company and the Alaska United Gold Mining Company hereinafter called the lessees.

WITNESSETH,—First, the lessor has this date and does by these presents lease unto the lessees all of the following described real property situated on and near Sheep Creek in the Harris Mining District, District of Alaska, to wit:

The Mexico Mill-site U. S. Mineral Entry No. 25, lot 71B. The Bellvidere Mill-site U. S. Mineral Entry No. 25, 72B. The Jumbo Mill-site U. S. Mineral Entry No. 60, lot No. 260. Also that certain piece or parcel of land beginning at a stake identical with post No. 2 Jumbo Mill-site U. S. Survey No. 260 on the meander line of Gastineau Channel, thence first course along the meander line of Gastineau Channel at ordinary high water mark N. 52° 00' W. 54 feet to stake No. 2; thence second course N. 48° 15' N. 200 feet to stake No. 3; thence S. 52.00' [686] E. 54 feet to the N. W. side line of Jumbo Mill-site U. S. Survey No. 260 to stake No. 4; thence S. 46° 15' W. along the Northwest side line Jumbo Mill-site U. S. Survey No. 260, 200 feet to stake No. 1, the place of beginning containing an area of one quarter of an acre more or less courses expressed

from the true meridian, Mag. Var. 29.30'; and also that certain water right known as the Sheep Creek Water Right and located on Sheep Creek about three quarters of a mile from its mouth, together with the flume and pipe-line connecting the same with the *bear* near the mill at the mouth of the said Sheep Creek, also the sawmill, boarding house, lumber sheds, wharf landing, mill dam, flumes, penstocks, waterwheels, and all other machinery and appliances used in connection with said sawmill, situated near the mouth of said Sheep Creek, together with all machinery, tools, equipment, plants of every kind and description now upon said property for a term of ten (10) years from the date hereof at a monthly rental of One Hundred and Twenty-five (\$125.00) Dollars per month, payable in gold coin of the United States on the first day of each month during the term of said lease at the office of the said lessees at Treadwell, Alaska; and it is hereby agreed, that if any rent shall be due and unpaid, or if default shall be made in any of the covenants herein contained, that it shall be lawful for the lessor to re-enter said premises and remove all persons therefrom, and the lessees do hereby covenant, promise and agree to pay the lessor the said rent in the manner hereinbefore specified, and not to let or underlet the whole or any part of said premises without the written consent of the lessor, nor to assign this lease or any part thereof without said written consent, and at the expiration of said term the party of the second part will quit and surrender said premises in as good state and condition as the same now are. [687]

It is the intention of the Lessees to erect, equip and maintain upon said premises a water power plant of substantial size and efficiency for the generation of electric power, and if at any time after Two (2) years from the date hereof the lessors or its assigns shall elect to take a current of *not to exceed three hundred* (300) electric horse-power which shall be taken from and at the generating plant to be installed upon the leased premises hereinbefore described, the lessees undertake covenant and agree to deliver said current to the lessor or its assigns upon the execution and delivery by the lessor or its assigns to the lessee of a deed or deeds conveying said leased property herein described to the parties of the second part. If prior to the expiration of nine years from the date hereof the lessor does not elect to convey to lessees or their assigns the property herein leased and accept in full consideration therefor the right to the use of the three hundred (300) electric horse power hereinbefore mentioned, the lessees may at their option prior to the expiration of the ten (10) years provided in this lease purchase the property herein leased absolutely from the lessor by paying to the lessor the sum of Twenty-five Thousand Dollars (\$25,000) in gold coin of the United States; and the lessor covenants and agrees upon tender of said sum of Twenty-five Thousand Dollars (\$25,000) to execute and deliver such deeds of conveyance to the property herein leased as hereinbefore specified, excepting only as to the title to (1) the one quarter acre tract hereinbefore described and (2) the premises occupied and used by

the existing wharf of the lessor to both of which the lessor now asserts only possessory titles. The lessees may at their own cost and expense undertake to perfect the said titles and should lessee wish so to [688] do the lessor shall lend all proper assistance in its power including the using of its name, and should the said titles be so perfected to the said premises or either of them they shall become the property of the lessor and remain covered by this lease and subject to all terms and conditions thereof.

The covenants herein contained shall be construed as running with the land and as a charge thereon, so that any successor or successors in interest to the lessor and or lessees who may acquire any interest in and to the titles to the said land shall be bound by this conveyance in the same manner as if they had executed this agreement; and the lessees hereof may require at their option that the property herein described be conveyed by the lessor to a responsible Trustee for the purpose of carrying out the terms of this agreement, or that deeds and conveyances covering the property herein leased be placed in escrow so as to ensure delivery of the same if required under the provisions of any of the covenants of this lease.

If neither of the options herein provided for are accepted by either the lessor or lessees then the property and rights herein described with all the improvements that are or that may hereafter be placed on the said premises shall be and become the property of the lessor.

The provisions herein as to the delivery of three

hundred (300) horse-power at the generating plant to be installed on the premises herein described contemplates the delivery of an uninterrupted current, but the lessees shall not be liable for damages that may arise from operating and physical causes beyond its control. [689]

IN WITNESS WHEREOF the parties hereto have hereunto set their hands and seals the day and year first above written.

(Executed in triplicate.)

Witness:

HAROLD LAWRENCE.

WALTER W. BLACK.

OXFORD MINING COMPANY.

By WALLACE HACKETT,

President.

And HENRY ENDICOTT,

Treasurer.

[Seal Oxford Mining Company.]

ALASKA TREADWELL GOLD MINING
COMPANY.

By H. H. TAYLOR,

President.

F. A. HAMMERSMITH,

Secretary.

ALASKA MEXICAN GOLD MINING COM-
PANY.

By H. H. TAYLOR,

President.

F. A. HAMMERSMITH,

Secretary.

ALASKA UNITED GOLD MINING COM-
PANY.

By H. H. TAYLOR,
President.

F. A. HAMMERSMITH,
Secretary.

[Seal Alaska Treadwell Gold Mining Company.]

[Seal Alaska Mexican Gold Mining Company.]

[Seal Alaska United Gold Mining Company.]

COMMONWEALTH OF MASSACHUSETTS,
COUNTY OF SUFFOLK,
CITY OF BOSTON,—ss.

Be it remembered that on this 14th day of October, 1909, before me, the undersigned, a Notary Public, in and for said County and State personally appeared Wallace Hackett, President, and Henry Endicott, Treasurer, of the Oxford Mining Company, a corporation organized under the laws of the State of Maine, to me known to be the individuals described in and who executed the foregoing instrument as such President and Treasurer; and said Henry [690] Endicott having affixed the seal of said Corporation to said instrument, they severally acknowledged to me that he, Wallace Hackett, as President, and he, Henry Endicott, as Treasurer of said Corporation, executed the foregoing instrument for and on behalf of said Corporation, as the free and voluntary act of said Corporation for the uses and purposes therein set forth. Then the said Henry Endicott, being by me first duly sworn, on his oath states that he is the Treasurer of Said Corporation, is acquainted and is the custodian, and has in his posses-

sion the corporate seal of said Corporation and that the seal hereinbefore affixed is the corporate seal of said Corporation and was affixed by him as such Treasurer by order of the Board of Directors of said Corporation.

In Witness Whereof I have hereunto set my hand and seal the date and year first above written.

[Notarial Seal]

(Signed) LLOYD A. FROST,
Notary Public.

My commission expires Dec. 5th, 1913.

STATE OF CALIFORNIA,
CITY AND COUNTY OF SAN FRANCISCO,—ss.

On this 12th day of November in the year One Thousand Nine Hundred and Nine, before me, P. J. Kennedy, a Notary Public, in and for said City and County, residing therein, duly commissioned and sworn, personally appeared H. H. Taylor and F. A. Hammersmith, known to me to be the President and Secretary, respectively, of Alaska Mexican Gold Mining Company and Alaska United Gold Mining Company, the corporations that executed the within and foregoing instrument, and to be the officers who executed the said instrument on behalf of said Corporations therein named, and they acknowledged to me that such corporations executed the same. [691]

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal at my office in the said City and County of San Francisco, the day

758 *Alaska Treadwell Gold Mining Co. et al.*

and year last above written.

[Notarial Seal]

(Signed) P. J. KENNEDY,
Notary Public in and for the City and County of San
Francisco, State of California.

STATE OF CALIFORNIA,
CITY AND COUNTY OF SAN FRANCISCO,—ss.

On this 12th day of November in the year One
Thousand Nine Hundred and Nine, before me, P. J.
Kennedy, a Notary Public, in and for said City and
County, residing therein, duly commissioned and
sworn, personally appeared H. H. Taylor and F. A.
Hammersmith, known to me to be the President and
Secretary, respectively, of Alaska Treadwell Gold
Mining Company, the Corporation that executed the
within and foregoing instrument, and to be the offi-
cers who executed the said instrument on behalf of
said Corporation therein named, and they acknowl-
edged to me that such Corporation executed the
same.

IN WITNESS WHEREOF I have hereunto set
my hand and affixed my official seal at my office in
said City and County of San Francisco, the day and
year last above written.

[Notarial Seal]

(Signed) P. J. KENNEDY,
Notary Public in and for the City and County of San
Francisco, State of California. [692]

CERTIFIED COPY of RESOLUTION PASSED
BY THE BOARD OF DIRECTORS OF
ALASKA TREADWELL GOLD MINING
COMPANY.

“Resolved that the proposed lease, dated October 14th, 1909, of certain real property particularly therein described and situated on and near Sheep Creek in the Harris Mining District, Alaska, made by and between Oxford Mining Company and Alaska Treadwell Gold Mining Company, Alaska Mexican Gold Mining Company and Alaska United Gold Mining Company, be and the same is hereby approved and accepted, and the President and Secretary are hereby authorized and directed, in the name of the Company and as its act and deed and under its corporate seal, to execute and deliver said lease to Oxford Mining Company.”

CERTIFICATE OF SECRETARY.

I, F. A. Hammersmith, hereby certify that I am the Secretary of Alaska Treadwell Gold Mining Company; that the foregoing resolution is a full, true and correct copy of a Resolution duly passed and adopted by the Board of Directors of said Company at a meeting held on the 11th day of November, 1909, as the same is now recorded on the minutes of the meeting of said Board of Directors.

In Witness Whereof I have hereunto set my hand as such Secretary and affixed the corporate seal of

said Company, this 11th day of November, 1909.

[Corporate Seal]

(Signed) F. A. HAMMERSMITH,
Secretary of Alaska Treadwell Gold Mining Com-
pany. [693]

CERTIFIED COPY OF RESOLUTION PASSED
BY THE BOARD OF DIRECTORS OF
ALASKA MEXICAN GOLD MINING COM-
PANY.

“Resolved that the proposed lease, dated October 14th, 1909, of certain real property particularly therein described and situated on and near Sheep Creek in the Harris Mining District, Alaska, made by and between Oxford Mining Company and Alaska Treadwell Gold Mining Company, Alaska Mexican Gold Mining Company and Alaska United Gold Mining Company, be and the same is hereby approved and accepted, and the President and Secretary are hereby authorized and directed, in the name of the Company and as its act and deed and under its corporate seal, to execute and deliver said lease to Oxford Mining Company.”

CERTIFICATE OF SECRETARY.

I, F. A. Hammersmith, hereby certify that I am the Secretary of Alaska Mexican Gold Mining Company; that the foregoing resolution is a full, true and correct copy of a Resolution duly passed and adopted by the Board of Directors of said Company at a meeting held on the 11th day of November, 1909, as the same is now recorded on the minutes of the meeting of said Board of Directors.

In Witness Whereof I have hereunto set my hand as such Secretary and affixed the corporate seal of said Company, this 11th day of November, 1909.

[Corporate Seal]

(Signed) F. A. HAMMERSMITH,
Secretary of Alaska Mexican Gold Mining Com-
pany.

CERTIFIED COPY OF RESOLUTION PASSED
BY THE BOARD OF DIRECTORS OF
ALASKA UNITED GOLD MINING COM-
PANY.

“Resolved that the proposed lease, dated October 14th, 1909, of certain real property particularly therein described and situated on and near Sheep Creek in the Harris Mining District, [694] Alaska, made by and between Oxford Mining Company and Alaska Treadwell Gold Mining Company, Alaska Mexican Gold Mining Company and Alaska United Gold Mining Company, be and the same is hereby approved and accepted, and the President and Secretary are hereby authorized and directed, in the name of the Company and as its act and deed and under its corporate seal, to execute and deliver said lease to Oxford Mining Company.”

CERTIFICATE OF SECRETARY.

I, F. A. Hammersmith, hereby certify that I am the Secretary of Alaska United Gold Mining Company; that the foregoing Resolution is a full, true and correct copy of a Resolution duly passed and adopted by the Board of Directors of said Company at a meeting held on the 11th day of November, 1909,

as the same is now, recorded on the minutes of the meeting of said Board of Directors.

In Witness Whereof I have hereunto set my hand as such Secretary and affixed the corporate seal of said Company, this 11th day of November, 1909.

[Corporate Seal]

(Signed) F. A. HAMMERSMITH,
Secretary of Alaska United Gold Mining Company.

COMMONWEALTH OF MASSACHUSETTS,
COUNTY OF SUFFOLK,
CITY OF BOSTON,—ss.

WHEREAS the International Trust Company, a corporation, has reserved unto itself for the benefit of itself and various persons therein interested a lien upon the property described in the foregoing lease for the sum of \$36,376 to secure the costs, advances, and charges in connection with the foreclosure of certain trust deeds upon certain property in the District of Alaska, a part of which is described in the [695] foregoing instrument.

NOW, THEREFORE, THIS INSTRUMENT WITNESSETH That in consideration of the covenants contained in the foregoing agreement said International Trust Company for the purpose of binding the interest so held upon said property by said lien, assents, agrees and ratifies the execution of the foregoing lease with the Alaska-Treadwell Gold Mining Company et al., Party of the Second Part, and agrees to substitute said lien upon any contract or contracts which may be made pursuant to the options contained in the said lease, so that the terms

and provisions of said contract may be carried out.

Executed in triplicate.

Signed this 14th day of October, 1909.

INTERNATIONAL TRUST COMPANY,

By JNO. M. GRAHAM,

Pres.

[Corporate Seal] HENRY L. JEWETT,

Sect.

Witnesses:

WALTER W. BLACK.

HAROLD LAWRENCE.

Commonwealth of Massachusetts,

County of Suffolk,

City of Boston,—ss.

Be it remembered that on the 14th day of October, 1909, before me, the undersigned Notary Public, in and for said county and State, personally appeared John M. Graham, President, and Henry L. Jewett, Secretary of the International Trust Company, a corporation, organized under the laws of the State of Massachusetts, to me known to be the individuals described in and who executed the foregoing instrument, as such President and Secretary for and on behalf of said International Trust Company as Trustee for the mortgage bondholders under said instrument described; the said Henry L. Jewett having affixed the seal of said corporation to said instrument and they severally acknowledged to me that he, John M. Graham as president, [696] and he, the said Henry L. Jewett, as Secretary of said Corporation, executed the foregoing instrument for and on behalf of said corporation as the free and

voluntary act and deed of said corporation as Trustee for the uses and purposes therein set forth.

Then the said Henry L. Jewett being by me first duly sworn on his oath states that he is the Secretary of said Corporation, is acquainted, is the custodian, and has in his possession the corporate seal of said corporation and that the seal hereinbefore affixed is the corporate seal of said corporation and was affixed by him as such Secretary by order of the Board of Directors of said Corporation,

IN WITNESS WHEREOF I have hereunto set my hand and official seal the day and year first above written.

[Notarial Seal]

(Signed) LLOYD A. FROST,
Notary Public.

My commission expires Dec. 5th, 1913.

COMMONWEALTH OF MASSACHUSETTS,
COUNTY OF SUFFOLK,
CITY OF BOSTON,—ss.

WHEREAS the International Trust Company, a corporation, has reserved a lien upon the property described in the foregoing lease, together with other property.

Now for the purpose of further securing said lien, the undersigned lessor in the foregoing instrument, by order of its Board of Directors, hereby assigns the rentals due or to become due under the foregoing lease to the International Trust Company to be applied, first upon the payment of interest on the \$15,000 item of compensation reserved in favor of said Trust Company at the rate of six per cent (6%) per

annum,—and second that the balance of said moneys be applied [697] pro rata upon the other items described in said lien so reserved.

Dated this 14th day of October, 1909, at Boston, Mass.

(Signed) OXFORD MINING COMPANY,
By WALLACE HACKETT,
President.

Attest: HENRY ENDICOTT,
Secretary.

which said agreement was duly filed for record at 1 o'clock P. M. on the 17th day of October, 1910, and duly recorded in Book 19 Miscellaneous, at page 2 of the records of the Juneau Recording District, wherein the property mentioned in said indenture and agreement is situated;

AND WHEREAS, on or about the 17th day of October, 1910, the parties of the second part had finished the erection and equipment upon the premises described in the said indenture and agreement of a water power plant of substantial size and efficiency pursuant to the provisions of said indenture and agreement and had expended in the erection and equipment of said water power plant a sum in excess of One Hundred Thousand (\$100,000) Dollars;

AND WHEREAS, the said water power plant was completed about one year sooner than contemplated in the said indenture and agreement of October 14, 1909, which allowed a period of two years from the date of said agreement for the erection of the said water power plant;

AND WHEREAS, thereafter on the 31st day of

October, 1909, the Oxford Mining Company, party of the first part herein, [698] duly elected to take the electric current provided for in the said indenture and agreement, which said election was accepted and agreed to by the parties of the second part hereinbefore mentioned on the said 31st day of October, 1910;

NOW, THEREFORE, under and pursuant to the provisions of the indenture and agreement of October 14, 1909, and the election of the party of the first part of October 31, 1910, the party of the first part, for and in consideration of the provisions of the said indenture and agreement of October 14, 1909, and pursuant to its election of October 31st, 1910; and in further consideration of the sum of One Hundred Thousand (\$100,000) Dollars expended in the erection and equipment of a water power plant of sufficient size and efficiency for the generation of electric power by the parties of the second part hereto, receipt of all of which considerations as above set forth is hereby acknowledged by the party of the first part, does by these presents grant, bargain and sell unto the parties of the second part, and to their heirs, assigns and successors in interest, forever, all of that certain property described in the said indenture and agreement of October 14, 1909, hereinbefore set forth, lying and being situate on and near Sheep Creek in the Harris Mining District, District of Alaska.

TOGETHER with all the tenements, hereditaments and appurtenances thereunto belonging or appertaining, and the reversion and reversions, remainder and remainders, rents, issues and profits thereof, it being the intention of this instrument in

conveying to comply in full with the undertaking of the part of the Oxford Mining Company made on the 14th day of October, 1909.

TO HAVE AND TO HOLD SAID premises, together with the [699] appurtenances unto the said parties of the second part and to their heirs, assigns and successors in interest forever.

IN WITNESS WHEREOF, the parties hereto have hereunto set their hands and seals the day and year first above written.

(Signed) OXFORD MINING COMPANY,
By WALLACE HACKETT,
President.
HENRY ENDICOTT,
Treasurer.

[Corporate Seal]

Signed, sealed and delivered in the presence of
LEWIS P. SHACKLEFORD.

L. W. LAWRENCE (or L. W. LANSMORE).

COMMONWEALTH OF MASSACHUSETTS,
COUNTY OF SUFFOLK,
CITY OF BOSTON,—ss.

It will be remembered that on the twenty-second day of April, 1911, before me, Alexander L. Pelkey, Notary Public in and for said State, County and City, personally appeared WALLACE HACKETT, president, and HENRY ENDICOTT, treasurer of the Oxford Mining Company, a corporation, organized under the laws of the State of Maine, known to me to be the individuals described in and who executed the foregoing instrument as said President and Treasurer, and the said HENRY ENDICOTT,

having affixed the seal of said corporation to said instrument, they severally acknowledged to me that WALLACE HACKETT as President and HENRY ENDICOTT as Treasurer of the said corporation, executed the foregoing instrument for and on behalf of said corporation to be the free and voluntary act of said corporation for the uses and purposes therein set forth. Then said HENRY ENDICOTT, being first duly sworn, on his oath states that he is the Treasurer of said corporation and he is acquainted with, is custodian of and has in his possession the corporate seal of said corporation, and that the seal herein [700] before affixed is the seal of said corporation and was affixed by him as said Treasurer by order of the Board of Directors of said corporation.

IN WITNESS WHEREOF I have herein set my hand and official seal the day and year first above written.

[Notarial Seal]

(Signed) ALEXANDER L. PELKEY,

Notary Public. [701]

[Exhibit "F"—Attached to Deposition of F. W. Bradley.]

THIS AGREEMENT, made this 22nd day of April, 1911, BETWEEN the Oxford Mining Company, a corporation, party of the first part, and the Alaska Treadwell Gold Mining Company, a corporation, the Alaska Mexican Gold Mining Company, a corporation, and the Alaska United Gold Mining Company, a corporation, parties of the second part, WITNESSETH;

THAT WHEREAS, on the 14th day of October, 1909, the parties hereto entered into an indenture and agreement in words and figures as follows, to wit:

THIS INDENTURE AND AGREEMENT made and entered into this 14th day of October, 1909, by and between OXFORD MINING COMPANY hereinafter called the lessor and the Alaska Treadwell Gold Mining Company, the Alaska Mexican Gold Mining Company and the Alaska United Gold Mining Company hereinafter called the lessees.

WITNESSETH.—First, the lessor has this date and does by these presents lease unto the lessees all of the following described real property situated on and near Sheep Creek in the Harris Mining District, District of Alaska, to wit:

The Mexico Mill-site U. S. Mineral Entry No. 25, lot 71B. The Bellvidere Mill-site U. S. Mineral Entry No. 25, lot 72B. The Jumbo Mill-site U. S. Mineral Entry No. 60, lot No. 260. Also that certain piece or parcel of land beginning at a stake identical with post No. 2 Jumbo Mill-site U. S. Survey No. 260 on the meander line of Gastineau Channel, thence first course along the meander line of Gastineau Channel at ordinary high water mark No. 52 00' W. 54 feet to stake No. 2; thence second course N. 48 15' E. 200 feet to stake No. 4; thence S. 52 [702] 00' E. 54 feet to the N.W. side line of Jumbo Mill-site U. S. Survey No. 260 to stake No. 4; thence S. 46 15' W. along the Northwest side line Jumbo Mill-site U. S. No. 260, 200 feet to stake No. 1, the place of beginning containing an area of one quarter of an acre more or less courses expressed from the true

meridian, Mag. Var. 29.30'; and also that certain water right known as the Sheep Creek Water Right and located on Sheep Creek about three quarters of a mile from its mouth, together with the flume and pipe-line connecting the same with the beach near the mill at the mouth of the said Sheep Creek, also the sawmill, boarding house, lumber sheds, wharf landing, mill dam, flumes, penstocks, water-wheels, and all other machinery and appliances used in connection with said sawmill, situated near the mouth of said Sheep Creek, together with all machinery, tools, equipment, plants of every kind and description now upon said property for a term of ten (10) years from the date hereof at a monthly rental of One hundred and Twenty-five (\$125.00) Dollars per month, payable in gold coin of the United States on the first day of each month during the term of said lease at the office of the said lessees at Treadwell, Alaska; and it is hereby agreed, that if any rent shall be due and unpaid, or if default shall be made in any of the covenants herein contained, that it shall be lawful for the lessor to re-enter said premises and remove all persons therefrom, and the lessees do hereby covenant, promise, and agree to pay the lessor the said rent in the manner hereinbefore specified, and not to let or underlet the whole or any part of said premises without the written consent of the lessor, nor to assign this lease or any part thereof without said written consent, and at the expiration of said term the party of the second part will quit and surrender said premises in as good state and condition as the same now are. [703]

It is the intention of the Lessees to erect, equip, and maintain upon said premises a water power plant of substantial size and efficiency for the generation of electric power, and if at any time after Two (2) years from the date hereof the lessors or its assigns shall * elect to take a current *of not to exceed three hun-*
* *dred* (300) electric horse-power which shall be
* taken from and at the generating plant to be in-
* stalled upon the leased premises hereinbefore described, the lessees undertake covenant and agree to deliver said current to the lessor or its assigns upon the execution and delivery by the lessor or its assigns to the lessee of a deed or deeds conveying said leased property herein described to the parties of the second part. If prior to the expiration of nine years from the date hereof the lessor does not elect to convey to lessees or their assigns the property herein leased and accept in full consideration therefor the right to the use of the three hundred (300) electric horse power hereinbefore mentioned, the lessees may at their option prior to the expiration of the ten (10) years provided in this lease purchase the property herein leased absolutely from the lessor by paying to the lessor the sum of Twenty-five Thousand Dollars (\$25,000) in gold coin of the United States; and the lessor covenants and agrees upon tender of said sum of Twenty-five Thousand Dollars (\$25,000.) to execute and deliver said deeds of conveyance to the property herein leased as hereinbefore specified, excepting only as to the title to (1) the one quarter acre tract hereinbefore described and (2) the premises occupied and used by the existing wharf of the lessor to

both of which the lessor now asserts only possessory titles. The lessees may at their own cost and expense undertake to perfect the said titles and should lessee wish so to [704] do the lessor shall lend all proper assistance in its power including the using of its name, and should the said titles be so perfected to the said premises or *either* of them they shall become the property of the lessor and remain covered by this lease and subject to all terms and conditions thereof.

The covenants herein contained shall be construed as running with the land and as a charge thereon, so, that any successor or successors in interest to the lessor or lessees who may acquire any interest in and to the titles to the said land shall be bound by this conveyance in the same manner as if they had executed this agreement; and the lessees hereof may require at their option that the property herein described be conveyed by the lessor to a responsible Trustee for the purpose of carrying out the terms of this agreement, or that deeds and conveyances covering the property herein leased be placed in escrow so as to ensure delivery of the same if required under the provisions of any of the covenants of this lease.

If neither of the options herein provided for are accepted by either the lessor or lessees then the property and rights herein described with all the improvements that are or that may hereafter be placed on the said premises shall be and become the property of the lessor.

* The provisions herein as to the delivery of
* three hundred (300) horse-power at the gen-

* erating plant to be installed on the premises here-
* in described contemplates the delivery of an un-
* interrupted current, but the lessees shall not be
* liable for damages that may arise from operating
* and physical causes beyond its control. [705]

IN WITNESS WHEREOF the parties hereto
have hereunto set their hands and seals the day and
year first above written. (Executed in triplicate.)

Witness:

HAROLD LAWRENCE.

WALTER W. BLACK.

OXFORD MINING COMPANY.

By WALLACE HACKETT,
President,

And HENRY ENDICOTT,
Treasurer.

[Seal Oxford Mining Company.]

ALASKA TREADWELL GOLD MINING
COMPANY.

By H. H. TAYLOR,
President,

F. A. HAMMERSMITH,
Secretary.

ALASKA MEXICAN GOLD MINING
COMPANY.

By H. H. TAYLOR,
President,

F. A. HAMMERSMITH,
Secretary.

ALASKA UNITED GOLD MINING COM-
PANY.

By H. H. TAYLOR,

President,

F. A. HAMMERSMITH,

Secretary.

[Seal Alaska Treadwell Gold Mining Co.]

[Seal Alaska Mexican Gold Mining Co.]

[Seal Alaska United Gold Mining Co.]

Commonwealth of Massachusetts,
County of Suffolk,
City of Boston,—ss.

Be it remembered that on this 14th day of October, 1909, before me, the undersigned, a Notary Public, in and for said County and State, personally appeared Wallace Hackett, President, and Henry Endicott, Treasurer, of the Oxford Mining Company, a corporation organized under the laws of the State of Maine, to me known to be the individuals described in and who executed the foregoing instrument as such President and Treasurer; and said Henry [706] Endicott having affixed the seal of said Corporation to said instrument, they severally acknowledged to me that he, Wallace Hackett, as President, and he, Henry Endicott, as Treasurer of said Corporation executed the foregoing instrument for and on behalf of said Corporation, as the free and voluntary act of said Corporation for the uses and purposes therein set forth. Then the said Henry Endicott, being by me first duly sworn, on his oath states that he is the Treasurer of Said Corporation, is acquainted and is the custodian, and has in his possession the corporate

seal of said Corporation and that the seal hereinbefore affixed is the corporate seal of said Corporation and was affixed by him as such Treasurer by order of the Board of Directors of said Corporation.

In Witness Whereof I have hereunto set my hand and seal the date and year first above written.

[Notarial Seal]

(Signed) LLOYD A. FROST,
Notary Public.

My commission expires Dec. 5th, 1913.

State of California,

City and County of San Francisco,—ss.

On this 12th day of November, in the year one thousand nine hundred and nine, before me, P. J. Kennedy, a Notary Public, in and for said City and County, residing therein, duly commissioned and sworn, personally appeared H. H. Taylor and F. A. Hammersmith, known to me to be the President and Secretary respectively, of Alaska Mexican Gold Mining Company and Alaska United Gold Mining Company, the corporations that executed the within and foregoing instrument, and to be the officers who executed the said instrument on behalf of said Corporations therein named, and they acknowledged to me that such corporations executed the same. [707]

IN WITNESS WHEREOF I have hereunto set my hand and affixed my official seal at my office in the said City and County of San Francisco, the day and year last above written.

[Notarial Seal]

(Signed) P. J. KENNEDY,
Notary Public in and for the City and County of San Francisco, State of California.

State of California,

City and County of San Francisco,—ss.

On this 12th day of November, in the year 'One Thousand Nine Hundred and Nine, before me, P. J. Kennedy, a Notary Public, in and for said City and County, residing therein, duly commissioned and sworn, personally appeared H. H. Taylor, and F. A. Hammersmith, known to me to be the President and Secretary, respectively, of Alaska Treadwell Gold Mining Company, the Corporation that executed the within and foregoing instrument, and to be the officers who executed the said instrument on behalf of said Corporation therein named, and they acknowledged to me that such Corporation executed the same.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal at my office in said City and County of San Francisco, the day and year last above written.

[Notarial Seal]

(Signed) P. J. KENNEDY,

Notary Public in and for the City and County of San Francisco, State of California. [708]

CERTIFIED COPY OF RESOLUTION PASSED
BY THE BOARD OF DIRECTORS OF
ALASKA TREADWELL GOLD MINING
COMPANY.

“Resolved, that the proposed lease, dated October 14th, 1909, of certain real property particularly therein described and situated on and near Sheep Creek in the Harris Mining District, Alaska, made by and between Oxford Mining Company and Alaska

Treadwell Gold Mining Company, Alaska Mexican Gold Mining Company and Alaska United Gold Mining Company, be and the same is hereby approved and accepted, and the President and Secretary are hereby authorized and directed, in the name of the Company and as its act and deed and under its corporate seal, to execute and deliver said lease to Oxford Mining Company,"

CERTIFICATE OF SECRETARY.

I, F. A. Hammersmith, hereby certify that I am the Secretary of Alaska Treadwell Gold Mining Company; that the foregoing resolution is a full, true and correct copy of a Resolution duly passed and adopted by the Board of Directors of said Company at a meeting held on the 11th day of November, 1909, as the same is now recorded on the minutes of the meeting of said Board of Directors.

In Witness whereof I have hereunto set my hand as such Secretary and affixed the corporate seal of said Company, this 11th day of November, 1909.

[Corporate Seal]

(Signed) F. A. HAMMERSMITH,
Secretary of Alaska Treadwell Gold Mining Company. [709]

CERTIFIED COPY OF RESOLUTION PASSED BY THE BOARD OF DIRECTORS OF ALASKA MEXICAN GOLD MINING COM- PANY.

"Resolved that the proposed lease dated October 14th, 1909, of certain real property particularly therein described and situated on and near Sheep Creek in the Harris Mining District, Alaska, made

by and between Oxford Mining Company and Alaska Treadwell Gold Mining Company, Alaska Mexican Gold Mining Company and Alaska United Gold Mining Company, be, and the same is hereby approved and accepted, and the President and Secretary are hereby authorized and directed, in the name of the Company and as its act and deed and under its corporate seal, to execute and deliver said lease to Oxford Mining Company.”

CERTIFICATE OF SECRETARY.

I, F. A. Hammersmith, hereby certify that I am the Secretary of the Alaska Mexican Gold Mining Company; that the foregoing resolution is a full, true and correct copy of a Resolution duly passed and adopted by the Board of Directors of said Company at a meeting held on the 11th day of November, 1909, as the same is now recorded on the minutes of the meeting of said Board of Directors.

In Witness whereof I have hereunto set my hand as such Secretary and affixed the corporate seal of said Company, this 11th day of November, 1909.

[Corporate Seal]

(Signed) F. A. HAMMERSMITH,
Secretary of Alaska Mexican Gold Mining Com-
pany.

CERTIFIED COPY OF RESOLUTION PASSED BY THE BOARD OF DIRECTORS OF ALASKA UNITED GOLD MINING COM- PANY.

“Resolved that the proposed lease, dated October 14th, 1909, of certain real property particularly therein described and situated on and near Sheep

Creek in the Harris Mining District, [710] Alaska, made by and between Oxford Mining Company and Alaska Treadwell Gold Mining Company, Alaska Mexican Gold Mining Company and Alaska United Gold Mining Company, be and the same is hereby approved and accepted and the President and Secretary are hereby authorized and directed, in the name of the company and as its act and deed and under its corporate seal, to execute and deliver said lease to Oxford Mining Company."

CERTIFICATE OF SECRETARY.

I, F. A. Hammersmith, hereby certify that I am the Secretary of Alaska United Gold Mining Company; that the foregoing Resolution is a full, true and correct copy of a Resolution duly passed and adopted by the Board of Directors of said Company at a meeting held on the 11th day of November, 1909, as the same is now, recorded on the minutes of the meeting of said Board of Directors.

In Witness Whereof I have hereunto set my hand as such Secretary and affixed the corporate seal of said Company, this 11th day of November, 1909.

[Corporate Seal]

(Signed) F. A. HAMMERSMITH,
Secretary of Alaska United Gold Mining Company.

Commonwealth of Massachusetts,
County of Suffolk,
City of Boston,—ss.

WHEREAS the International Trust Company, a corporation, has reserved unto itself for the benefit of itself and various persons therein interested a lien

upon the property described in the foregoing lease for the sum of \$36,376. to secure the costs, advances, and charges in connection with the foreclosure of certain trust deeds upon certain property in the District of Alaska, a part of which is described in the [711] foregoing instrument.

NOW, THEREFORE, THIS INSTRUMENT WITNESSETH, That in consideration of the covenants contained in the foregoing agreement said International Trust Company, for the purpose of binding the interest so held upon said property by said lien, assents, agrees and ratifies the execution of the foregoing lease with the Alaska-Treadwell Gold Mining Company et al., Party of the Second Part, and agrees to substitute said lien upon any contract or contracts which may be made pursuant to the options contained in said lease, so that the terms and provisions of said contract may be carried out.

Executed in triplicate.

Signed this 14th day of October, 1909.

INTERNATIONAL TRUST COMPANY.

By JNO. M. GRAHAM,

Pres.,

HENRY L. JEWETT,

Sect.,

[Corporate Seal]

Witnesses:

WALTER W. BLACK.

HAROLD LAWRENCE.

Commonwealth of Massachusetts,
County of Suffolk,
City of Boston,—ss.

Be it remembered that on the 14th day of October, 1909, before me, the undersigned Notary Public, in and for said county and State, personally appeared John M. Graham, President and Henry L. Jewett, Secretary of the International Trust Company, a corporation organized under the laws of the state of Massachusetts, to me known to be the individuals described in and who executed the foregoing instrument, as such President and Secretary for and on behalf of said International Trust Company as Trustee for the mortgage bondholders under said instrument described; the said Henry L. Jewett having affixed the seal of said corporation to said instrument and they severally acknowledged to me that he, John M. Graham as president, [712] and he, the said Henry L. Jewett, as Secretary of said Corporation, executed the foregoing instrument for and on behalf of said corporation as the free and voluntary act and deed of said corporation as Trustee for the uses and purposes therein set forth.

Then the said Henry L. Jewett being by me first duly sworn on his oath states that he is the Secretary of said Corporation, is acquainted, is the custodian, and has in his possession the corporate seal of said corporation and that the seal hereinbefore affixed is the corporate seal of said corporation and was affixed by him as such Secretary by order of the Board of Directors of said Corporation.

IN WITNESS WHEREOF I have hereunto set

my hand and official seal the day and year first above written.

[Notarial Seal]

(Signed) LLOYD A. FROST,
Notary Public.

My commission expires Dec. 5th, 1913."

Commonwealth of Massachusetts,
County of Suffolk,
City of Boston,—ss.

WHEREAS the International Trust Company a corporation has reserved a lien upon the property described in the foregoing lease together with other property.

Now for the purpose of further securing said lien, the undersigned lessor in the foregoing instrument, by order of its Board of Directors, hereby assigns the rentals due or to become due under the foregoing lease to the International Trust Company to be applied, first upon the payment of interest on the \$15,000 item of compensation reserved in favor of said Trust Company at the rate of six per cent (6%) per annum,—and second that the balance of said moneys be applied [713] pro rata upon the other items described in said lien so reserved.

Dated this 14th day of October, 1909, at Boston, Mass.

(Signed) OXFORD MINING COMPANY.

By WALLACE HACKETT.

President.

Attest: HENRY ENDICOTT,

Secretary.

—which said agreement was duly filed for record at

1 o'clock P. M. on the 17th day of October, 1910, and duly recorded in Book 19 Miscellaneous, at page 2 of the records of the Juneau Recording District, wherein the property mentioned in said indenture and agreement is situated;

AND WHEREAS, on or about the 17th day of October, 1910, the parties of the second part had finished the erection and equipment upon the premises described in the said indenture and agreement of a water power plant of substantial size and efficiency pursuant to the provisions of said indenture and agreement and had expended in the erection and equipment of said water power plant a sum in excess of One Hundred Thousand (\$100,000) Dollars;

AND WHEREAS, the said water power plant was completed about one year sooner than contemplated in the said indenture and agreement of October 14, 1909, which allowed a period of two years from the date of said agreement for the erection of the said water power plant;

* AND WHEREAS, thereafter on the 31st day
* of October, 1909, the Oxford Mining Company,
* party of the first part herein, [714] duly
* elected to take the electric current provided for
* in the said indenture and agreement, which said
* election was accepted and agreed to by the parties
* of the second part hereinbefore mentioned on the
* said 31st day of October, 1910;

NOW, THEREFORE, under and pursuant to the provisions of the indenture and agreement of October 14, 1909, and the election of the party of the first part of October 31, 1910, the party of the first part,

for and in consideration of the provisions of the said indenture and agreement of October 14, 1909, and pursuant to its election of October 31st, 1910; and in further consideration of the sum of One Hundred Thousand (\$100,000) Dollars expended in the erection and equipment of a water power plant of sufficient size and efficiency for the generation of electric power by the parties of the second part hereto, receipt of all of which considerations as above set forth is hereby acknowledged by the party of the first part, does by these presents grant, bargain and sell unto the parties of the second part, and to their heirs, assigns and successors in interest, forever, all of that certain property described in the said indenture and agreement of October 14, 1909, hereinbefore set forth, lying and being situate on and near Sheep Creek in the Harris Mining District, District of Alaska.

TOGETHER with all the tenements, hereditaments and appurtenances thereunto belonging or appertaining, and the reversion and reversions, remainder and remainders, rents, issues and profits thereof, it being the intention of this instrument in conveying to comply in full with the undertaking on the part of the Oxford Mining Company made on the 14th day of October, 1909.

TO HAVE AND TO HOLD SAID premises together with the [715] appurtenances unto the said parties of the second part and to their heirs, assigns and successors in interest forever.

IN WITNESS WHEREOF, the parties hereto

have hereunto set their hands and seals the day and year first above written.

OXFORD MINING COMPANY.

By WALLACE HACKETT,

President.

HENRY ENDICOTT,

Treasurer.

[Corporate Seal]

Signed, sealed and delivered in the presence of

LEWIS P. SHACKLEFORD,

L. W. LAWRENCE.

Commonwealth of Massachusetts,

County of Suffolk,

City of Boston,—ss.

It will be remembered that on the twenty-second day of April, 1911, before me, Alexander L. Pelkey, Notary Public in and for said State, County and City, personally appeared WALLACE HACKETT, president, and HENRY ENDICOTT, treasurer of the Oxford Mining Company, a corporation organized under the laws of the State of Maine, known to me to be the individuals described in and who executed the foregoing instrument as said President and Treasurer, and the said HENRY ENDICOTT, having affixed the seal of said corporation to said instrument, they severally acknowledged to me that WALLACE HACKETT as President and HENRY ENDICOTT as Treasurer of the said corporation executed the foregoing instrument for and on behalf of said corporation to be the free and voluntary act of said corporation for the uses and purposes therein set forth. Then said HENRY ENDICOTT, being

first duly sworn, on his oath states that he is the Treasurer of said corporation and he is acquainted with, is custodian of and has in his possession the corporate seal of said corporation, and that the seal herein [716] before affixed is the seal of said corporation and was affixed by him as said Treasurer by order of the Board of Directors of said corporation.

IN WITNESS WHEREOF I have herein set my hand and official seal the day and year first above written.

[Notarial Seal]

ALEXANDER L. PELKEY,
Notary Public. [717]

AND WHEREAS, thereafter on the 31st day of October, 1910, the water power plant provided for in the fourth paragraph of said agreement was duly erected and equipped prior to that time, and the party of the first part duly elected to take the current of electric power provided for in said indenture and agreement of October 14, 1909, which said election was agreed and consented to by the parties of the second part;

AND WHEREAS, thereafter in the month of January, 1911, a certain instrument purported to have been executed by Joseph T. Gilbert, party of the first part, and Alaska Perseverance Mining Company, a corporation, party of the second part, was spread on the records of the Juneau Mining District, and is in words and figures following, to-wit:

THIS INDENTURE made this 3rd day of December, 1910, between Joseph T. Gilbert, of Gilbertsville,

Otaega County, State of New York, party of the first part, and the Alaska Perseverance Mining Company, a corporation organized and existing under the laws of the State of New York, partly of the second part; WITNESSETH:

That the said party of the first part for and in consideration of One Dollar and other good and valuable consideration, the receipt whereof is hereby acknowledged, does by these presents grant; bargain; sell; remise, release, convey and confirm to the said party of the second part, his successors and assigns the property described in the following agreement.

THIS AGREEMENT made and entered into this seventeenth day of June, A. D. 1897, by and between Joseph T. Gilbert, of the City of Milwaukee, State of Wisconsin, party of the one part, and the Nowell Gold Mining Company, a corporation organized under the laws of the State of Maine, and doing business in the District of Alaska, the party of the other part.

WITNESSETH:

That whereas the said Joseph T. Gilbert has sold by deed given June 16, 1897, to the said Nowell Gold Mining Company, a certain mill site, water rights, saw mill, and appliances, situate at Sheep Creek in the Harris Mining District, District of Alaska, for the sum of Twenty-five Thousand (\$25,000.) dollars, and other good and valuable considerations hereinafter specifically set forth.

Now therefore, it is understood by and between the parties hereto that in case the said Joseph T. Gilbert, his heirs or assigns, should at any time desire to develope by tunnel, or otherwise, or to operate any

of the property, formerly owned by the Juneau Mining and Manufacturing Company, that he and they shall have the right and preference to take and use any surplus water not required by the said Nowell Gold Mining Company for use in [718] operating their own properties at Sheep Creek and in Silver Bow Basin in said District; that he or they may draw the surplus water from any point of flumes or pipe lines belong to said Company, providing that it may be done without expense to the said Nowell Gold Mining Company, and that it shall not interfere with the operations of the properties, or the business of said Company; it is further understood and agreed that the said Nowell Gold Mining Company shall have the right and privilege to sell or dispose of any power to other parties arising from said surplus water when the same shall not be needed or required by the said Joseph T. Gilbert, his heirs, or assigns, in operating any plant that may be erected by him, his heirs or assigns, in working or developing his properties acquired from the Juneau Mining and Manufacturing Company. It is further hereby stipulated and agreed by and between the parties hereto, that in case of sale by the Nowell Gold Mining Company of its mines, mills, millsites, and water rights, or any part of same, situated at Sheep Creek and in Silver Bow Basin, in the District aforesaid, to any person, persons, or corporation, that the said Nowell Gold Mining Company shall not have the right to dispose the said water right hereby acquired from the said Joseph T. Gilbert, to any person persons or corporations, other than for the purpose of operating

the property held and owned by the said Nowell Gold Mining Company at Sheep Creek in the District aforesaid, at the time of said sale, provided that said Joseph T. Gilbert shall require the use of said water or the power generated thereby.

It is further understood and agreed by the parties hereto that the said Joseph T. Gilbert, his heirs or assigns shall be entitled to use for millsite or power purposes a frontage of not more than four hundred (400) feet commencing at post number two (2) of that certain piece or parcel of land formerly held and owned by one Kittie Richardson, adjoining the Jumbo Mill-site and extended thence along the beach in a southeasterly direction four hundred feet and extending back from the beach three hundred thirty-one and four tenths ($331\frac{4}{10}$) feet.

It is further understood and agreed by and between the parties hereto that the said Joseph T. Gilbert, his heirs or assigns shall have a right of way over and upon the land of said Nowell Gold Mining Company situate in the vicinity of Sheep Creek, District of Alaska, and that the said Nowell Gold Mining Company shall have a right of way over and upon the premises comprising four hundred (400) feet in length by three hundred thirty-one and four tenths ($331\frac{4}{10}$) feet reserved by the said Joseph T. Gilbert as herein set forth.

It is further understood and agreed by and between the parties hereto that the said Joseph T. Gilbert shall have the use and benefit as well as the possession of that certain saw mill known as the Sheep Creek saw mill and situate near the mouth of Sheep

Creek up to and until January 1, 1900, and that he shall have for the purpose of operating and running said mill all the water necessary from said Sheep Creek flume and pipe line to operate said mill; or in the event of electric power to replace said water, then the said Nowell Gold Mining Company shall furnish, free of cost to the said Joseph T. Gilbert, all the power necessary to operate the said mill.

It is further understood and agreed by and between the parties hereto that that certain building and machinery thereto used as a dry house, situate near the saw mill, is the property of William T. Iliff, and in no way effected by the sale from the said Gilbert to the said Nowell Gold Mining Company. It is further understood and agreed by and between the parties hereto that in [719] case said saw mill shall be destroyed by fire that neither party shall be held responsible, one to the other. It is mutually understood and agreed by and between the parties that the water and ground privileges in favor of the said Joseph T. Gilbert are an essential and integral part of this contract and that the Nowell Gold Mining Company obligates itself and assigns to aid and assist without expense to itself in every way possible the said Joseph T. Gilbert to the use of such privileges.

IN WITNESS WHEREOF the said Joseph T. Gilbert has hereunto set his hand and seal this twenty-third day of June, A. D. 1897 and the said Nowell Gold Mining Company by its president and by authority of the Board of Directors of said Com-

pany has set the seal of its President this 17th day of June, A. D. 1897.

JOSEPH T. GILBERT,
NOWELL GOLD MINING COMPANY.

By THOMAS S. NOWELL,
Its Pres.

In presence of:

J. J. MALONY.

JOHN R. WINN.

M. H. LATIMER.

E. F. CASSEL.

The above agreement is endorsed as follows:

District of Alaska,
Juneau,—ss.

The within instrument was filed for record at 2:30 o'clock P. M. June 27th, 1899, and duly recorded in Book 15 Deeds, etc., on page 472 of the records of this district.

Sgn.—NORMAN E. MALCOLM,
District Recorder.

For a full and accurate description of the property conveyed by the said party of the first part to the said party of the second part, the above agreement made between Joseph T. Gilbert and the Nowell Gold Mining Company is here quoted for the purpose of fully describing the property conveyed in this agreement made between the party of the first part and the party of the second part.

IN WITNESS WHEREOF, the party of the first

part has hereunto set his hand and seal this 3rd day of December, 1910.

JOSEPH T. GILBERT.

Signed, sealed and delivered in presence of

F. H. DONALDSON.

Now therefore pursuant to the agreement of the parties hereto of October 31, 1910, and the election of the party of the first part to take the electric current provided for in the agreement of October 14, 1909, formal conveyance of the said property has been made by the Oxford Mining Company to the parties of the second part;

NOW, THEREFORE, in consideration of the premises, it is hereby agreed that if the parties of the second part hereto are deprived at any time by Alaska Perseverance Mining Company, Joseph T. Gilbert his or their successors or assigns, of any of the water now appropriated and used by the second parties out of Sheep Creek at their power plant, then the party of the first part shall only be entitled to the three hundred (300) horse power of electric current provided in the agreement dated October 14th, 1909, decreased by the number of horse power that could be [720] generated by the second parties at their plant with the water which the second parties may have been deprived by Alaska Perseverance Mining Company, Joseph T. Gilbert, his or their successors or assigns.

IN WITNESS WHEREOF, the party of the first part has hereunto set its hand and seal the day and

year first above written.

OXFORD MINING COMPANY.

By WALLACE HACKETT,

President.

HENRY ENDICOTT,

Treasurer.

Signed, sealed and delivered in the presence of

LEWIS P. SHACKLEFORD.

L. W. LATTIMORE. [721]

[Exhibit "G"—Attached to Deposition of F. W.
Bradley.]

THIS AGREEMENT made and entered into this 12th day of September, 1911, by and between the ALASKA-TREADWELL GOLD MINING COMPANY, a corporation, and the ALASKA-JUNEAU GOLD MINING COMPANY, a corporation, WITNESSETH:

That Whereas the Alaska-Juneau Gold Mining Company is operating mines in the Silver Bow Basin, Alaska, and is now engaged in driving a tunnel from a point near Snow Slide Gulch with a view of reaching its property in the Silver Bow Basin;

And Whereas the said Alaska-Juneau Gold Mining Company is using the waters of Gold Creek for the purpose of furnishing power and for other purposes in connection with the work carried on by it in driving said tunnel;

And Whereas Gold Creek freezes up at times during the winter months so that the flow of water therein is not sufficient to furnish power for use in connection with the driving of said tunnel;

And Whereas the said Alaska-Juneau Gold Min-

ing Company is desirous of making arrangements with the said Alaska-Treadwell Gold Mining Company to purchase from it electric power to be used during such periods as the waters in Gold Creek have by reason of the frost and cold weather diminished to such an extent as to be insufficient to furnish the necessary power.

NOW THEREFORE it is agreed by and between the parties that the Alaska-Juneau Gold Mining Company shall build a pole line so that wires may be stretched thereon connecting the portal of its said tunnel near Snow Slide Gulch with the main line of the Alaska-Treadwell Gold Mining Company over which electricity is transmitted from Sheep Creek to the Treadwell mine, and the said Alaska-Treadwell Gold Mining Company agrees to furnish the Alaska-Juneau Gold Mining Company electric power for use in its said tunnel in connection with the driving of the same during such periods only that it shall be absolutely necessary for the said Alaska-Juneau Gold Mining Company to make use of such electric power [722] because of the fact that the waters of Gold Creek have been so diminished by reason of the frost and cold weather occurring during the winter months that the same are insufficient to furnish the power necessary in connection with the driving of the Alaska-Juneau Gold Mining Company's said tunnel.

The Alaska-Juneau Gold Mining Company to pay the sum of one cent per kilowatt hour for all electric power furnished hereunder.

It is expressly agreed that the Alaska-Treadwell Gold Mining Company does not agree to furnish

electric power under this agreement except only during such times in the winter months as the severe cold and frost diminish the water in Gold Creek to such an extent that the natural flow thereof is not sufficient to furnish the power necessary in order to carry on the work of driving the tunnel and then only for the periods during which such shortage of water so caused by the freezing of the Creek exists.

Dated the day and year first above written.

ALASKA-TREADWELL GOLD MINING
CO.

By ROBT. A. KINZIE,
Its Superintendent and General Manager.
ALASKA-JUNEAU GOLD MINING COM-
PANY,

By F. W. BRADLEY,
Its President. [723]

And the defendants, to further maintain the issues on their part, offered in evidence the deposition of C. L. Cory, the witness whose testimony was taken by deposition in the city of San Francisco, and upon the stipulation attached to said deposition, which said deposition of said C. L. Cory so taken was received and read in evidence and the testimony of the said C. L. Cory so given by deposition and received in evidence in this cause is as follows:

*In the District Court for the Territory of Alaska,
Division No. 1, at Juneau.*

Case No. 968-A.

ALASKA GASTINEAU MINING COMPANY, a
Corporation,

Plaintiff,

vs.

ALASKA TREADWELL GOLD MINING COM-
PANY, a Corporation, ALASKA UNITED
GOLD MINING COMPANY, a Corporation,
ALASKA MEXICAN GOLD MINING
COMPANY, a Corporation, and ROBERT A.
KINZIE,

Defendants.

Stipulation.

It is hereby stipulated that the deposition of C. L. Cory may be taken in response to the hereunto attached interrogatories, both direct and cross, and that such deposition may be taken before P. J. Kennedy, a notary public in and for the State of California, or before Grant H. Smith, a notary public in and for State of California, or before any other notary public, without commission from the Court; and when the deposition shall have been so taken it shall be returned by such notary, to the Clerk of the District Court, at Juneau, Alaska, as provided by law, and may be read in evidence on the trial in this case, subject to such objections as might be made if the witness were personally present and testifying orally except that all objections as to the *for* of the

question are hereby waived.

Dated this 30th day of January, 1913.

SHACKLEFORD & BAYLESS,
Z. R. CHENEY,

Attorneys for Plaintiff.
HELLENTHAL & HELLENTHAL,
Attorneys for Defendants. [724]

*In the District Court for the Territory of Alaska,
Division No. 1, at Juneau.*

Case No. 968-A.

ALASKA GASTINEAU MINING COMPANY, a
Corporation,
Plaintiff,

vs.

ALASKA TREADWELL GOLD MINING COM-
PANY, a Corporation, ALASKA UNITED
GOLD MINING COMPANY, a Corporation,
ALASKA MEXICAN GOLD MINING
COMPANY, a Corporation, and ROBERT A.
KINZIE,

Defendants.

Interrogatories to be Propounded to C. L. Cory.

Interrogatory No. 1:

State your name. Where do you reside?

Interrogatory No. 2:

What is your profession? State your calling.

Interrogatory No. 3:

If you state that you are by profession an electrical engineer, you may state fully at what school or schools you were educated as such electrical engineer, and what experience you have had as an electrical en-

gineer. State in detail.

Interrogatory No. 4:

What is your present occupation and position, what duties do you perform in connection with the position occupied by you?

Interrogatory No. 5:

Do you know what constitutes a current of electricity of not to exceed 300 electric horse-power?

Interrogatory No. 6:

If you answer the preceding question by stating that you do know what constitutes a current of not to exceed 300 electric [725] horse-power, you may state of what such a current consists, stating your views fully and in detail upon this question.

Interrogatory No. 7:

What is the unit of electric power?

Interrogatory No. 8:

If you answer the preceding interrogatory by stating that a watt is the unit of electrical power, you may state what constitutes a watt.

Interrogatory No. 9:

The amperes and voltage of a three phase current being known, how do you determine the number of watts?

Interrogatory No. 10:

How many watts constitute an electric horse-power?

Interrogatory No. 11:

Where a current of not to exceed a given amount of horse-power is spoken of and no mention is made of a power factor, what, if any, power factor is necessarily understood?

Interrogatory No. 12:

In a case where it is sought to make a current of not to exceed 300 horse-power available for the use of another, and nothing is said as to the use of which said power was to be applied, or the type of motors or other apparatus to be installed, or the manner or place of use, what power factor is understood, if any?

Interrogatory No. 13:

Where the place and manner of use is not specified, and the question of what type of motor, the place of use, the manner of installing the motor, and other matters [726] in connection with the operations of the motor, are left entire in the control of the person to whom the power is furnished and no particular power factor is mentioned or referred to, is it possible to supply any particular power factor as the power factor understood by the parties except unity power factor?

Interrogatory No. 14:

If you answer the preceding interrogatory by stating that it is not possible to supply or imply any power factor under the circumstances mentioned, except unity power factor, you may state your reasons why.

Interrogatory No. 15:

Where the current sought to be made available by a power company for the use of another is a current of not to exceed 300 electric horse-power to be taken from and at the generating plant, and no mention is made of a power factor, and neither the type or form of motor to be used is specified or referred to, nor the place of use, the manner in which it is to be installed, how would you proceed to measure such

a current, and what apparatus would you employ for that purpose in a case where the voltage is kept constant by means of a Tirril regulator?

Interrogatory No. 16:

Where an automatic instantaneous circuit-breaker is set so as to go out at about [727] 60 amperes on a three phase current with a voltage of 2300 impressed, would such apparatus permit the uninterrupted flow of a current of not to exceed 300 horsepower?

Interrogatory No. 17:

Where a current of not to exceed 300 electric horsepower is sought to be made available for the use of another, the current to be taken from and at the generating plant and no mention is made of a power factor, nothing being said concerning the type of motor, or other apparatus to be installed, or about the use to which the power is to be applied, as well as the type of motors used, the place of use, the manner of installing the motor, all being matters left to the control of the party to whom the power is furnished, could such a current be measured by means of a wattmeter which automatically takes in consideration the power factor?

Interrogatory No. 18:

You may state whether the power factor of the various types of motors in use is the same.

Interrogatory No. 19:

You may state whether the power factor of a motor in use is constant, or whether the same varies depending upon the conditions of the load and other matters in connection with the operations carried on.

